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Radian Corp., Research Triangle Park, NC

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16. ABSTRACT

The U.S. Environmental Protection Agency (EPA) has several activities that require speciated particulate matter (PM) or volatile organic compound (VOC) profiles from several source categories. In an effort to update the available speciated PM profile data base, EPA has initiated studies to update the "Receptor Model Source Composition Libreary" (EPA-450/4-85-002) and produce a revision entitled "Air Emissions Species Manual - Volume II, Particulate Matter Species Profiles" (EPA-450/2-88-003b). Similarly for VOC emissions, EPA has performed studies to revise the "Volatile Organic Compound Species Data Manual - Second Edition" (EPA-450/4-80-015) and provide an updated version in the "Air Emissions Species Manual - Volume I, Volatile Organic Compound Species Profiles" (EPA-450/2-88-003a).

The primary purpose of this document is to update the PM profiles in the Air Emissions Species Manual, Volume II with new information obtained from contacts with principal researchers in the field of PM species profiles and source receptor modeling. The new profiles were developed using the procedures and protocols specified in the Air Emissions Species Manual, Volume II. The profiles are based on data voluntarily submitted by the researchers.

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By:
Radian Corporation
3200 Progress Center
P.O.Box 13000
Research Triangle Park, North Carolina 27709

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William B. Kuykendal, Project Officer
Office Of Air Quality Planning And Standards
Office Of Air And Radiation
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

Charles C. Masser, Project Officer
Air And Energy Engineering Research Laboratory
Office Of Research And Development
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

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FOREWORD

This report is the result of a cooperative effort between the Office of Air Quality Planning and Standards' Air Quality Management Division (AQMD) and the Office of Research and Development's Air and Energy Engineering Research Laboratory (AEERL). The overall management of the program was the responsibility of AQMD.

ABSTRACT

The U. S. Environmental Protection Agency (EPA) has several ongoing activities that require speciated volatile organic compound (VOC) or particulate matter (PM) profiles from several source categories. In 1980, EPA published the "Volatile Organic Compound (VOC) Species Data Manual, Second Edition" (EPA-450/4-80-015) which provided VOC species profiles for some emission source categories. In 1985, EPA published the "Receptor Model Source Composition Library" (EPA-450/4-85-002) which contained particulate matter (PM) species profiles for several source categories. More recently, EPA published the "Air Emissions Species Manual - Volume I, Volatile Organic Compound (VOC) Species Profiles" (EPA-450/2-88-033a) and the "Air Emissions Species Manual - Volume II, Particulate Matter Species Profiles" (EPA-450/2-88-033b). These documents represent expansions of the 1980 and 1985 VOC and PM species profile documents. As part of an effort to update the VOC and PM profile data bases, EPA has initiated several studies. The objective of the current study was to update the VOC and PM Species Manuals by adding in new profiles and making necessary revisions to existing profiles.

The PM update was performed by contacting researchers working in the areas of PM species profile development and source receptor modeling. These researchers were questioned regarding the availability of PM species profile data that were not already contained in the Source Composition Library or the Air Emissions Species Manual. New species profiles were developed from data submitted by the researchers for a variety of source categories. The new profiles were developed according to the protocols and procedures specified in the PM Air Emissions Species Manual (EPA-450/2-88-003b).

The VOC update primarily reflects information on oil wells and oil field operations that EPA obtained from the Tulsa City-County Health Department. Tulsa recently conducted a sampling and analysis program to quantify emissions of 30 organic compounds from six different types of oil field operations. The Tulsa data were submitted to EPA and profiles were developed according to the protocols and procedures specified in the VOC Air Emissions Species Manual (EPA-450/2-88-033a).

Minor revisions were made to existing VOC profiles for light-duty

gasoline vehicles to reflect corrections necessary for compounds that coelute on the gas chromatography analyses. The specific VOC profiles affected by the revisions are 1101, 1203, and 1204. The primary revisions were to the benzene/cyclohexane and propane/propene splits.

This Addendum also has the purpose providing the VOC Species Manual user with the notification that the printed version of the existing manual, "Air Emissions Species Manual - Volume I, Volatile Organic Compound Species Profiles" (EPA-450/2-88-003a), contains erroneous CAS numbers for several chemicals. The computerized version of the speciation data base system contains correct CAS numbers. The hard copy report, however, is in error due to a bug in the programming used to print the data. The programming bug caused the last digit in the first field of the CAS number to be duplicated automatically as the first digit of the second field of the number after the dash. The user should verify any CAS number in the printed data from other sources. This problem will be corrected in the second edition of the manual to be published in the near future.

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EXECUTIVE SUMMARY

The U. S. Environmental Protection Agency (EPA) has several activities that require speciated particulate matter (PM) or volatile organic compound (VOC) profiles from several source categories. Some of these activities are preparation of air toxics and acid precipitation emission inventories, acid precipitation modeling studies, receptor modeling, and ozone strategy development. In an effort to update the available speciated PM profile data base, EPA has initiated studies to update the "Receptor Model Source Composition Library" (EPA-450/4-85-002) and produce a revision entitled "Air Emissions Species Manual - Volume II, Particulate Matter Species Profiles" (EPA-450/2-88-003b). Similarly for VOC emissions, EPA has performed studies to revise the "Volatile Organic Compound Species Data Manual - Second Edition" (EPA-450/4-80-015) and provide an updated version in the "Air Emissions Species Manual - Volume I, Volatile Organic Compound Species Profiles" (EPA-450/2-88-003a).

The primary objective of the current study was to update the PM profiles in the Air Emissions Species Manual, Volume II with new information obtained from contacts with principal researchers in the field of PM species profiles and source receptor modeling. The new profiles were developed using the procedures and protocols specified in the Air Emissions Species Manual, Volume II. The profiles are based on data voluntarily submitted by the researchers.

Each PM profile in this document contains the following information:

Profile name
Profile number
Profile data quality
Control device identification
Reference(s)
Data source
Source Classification Code (SCC)
Mass fraction data

Species identification: species identified by Chemical Abstract System (CAS) number, species number, and species name

Composition data in weight percent for four size ranges: 0-2.5 um, 2.5-10 um, 0-10 um, and total particulate measured

Uncertainty associated with composition data for four size ranges: 0-2.5 um, 2.5-10 um, 0-10 um, and total particulate measured

Date

This update includes 158 new PM profiles representing 14 source categories. Profiles were developed for two new source categories, metal fabrication and construction, which were not covered in the Air Emissions Species Manual, Volume II.

Each profile in this update was assigned the SCC or area source code considered appropriate for the specific profile, based on engineering judgement. Profile assignments in this report were not made for all SCC's nor were industry specific average profiles developed. This approach differs from that followed in the Air Emissions Species Manual, Volume II.

The current study also contains new VOC profiles for a small number of source types related to the oil production industry, principally oil wells and oil field storage tanks. These data were produced from recent testing performed by the Tulsa City-County Health Department. The oil production profiles were developed using the same format and procedures outlined in the Air Emissions Species Manual - Volume I (EPA-450/2-88-003a). Each VOC profile contains the following information:

Profile name
Profile number
Profile data quality
Control device identification
References
Data source
Source Classification Code (SCC)

Chemical species identified by: Storage and Retrieval of Aerometric Data (SAROAD) code, Chemical Abstract System (CAS) number, species name, molecular weight, weight percent

Date

Minor revisions were made to three existing VOC profiles and these revised profiles are included in this addendum. The affected profiles, 1101, 1203, and 1204, are for light-duty gasoline vehicles. The revisions were necessary to correct a problem caused by compounds that coelute during gas chromatography analyses. Revisions were made to the relative weight percentages assigned to each coeluting compound.

This Addendum also has the purpose providing the VOC Species Manual user with the notification that the printed version of the existing manual, "Air Emission Species Manual - Volume I, Volatile Organic Compound Species Profiles" (EPA-450/2-88-003a), contains erroneous CAS numbers for several chemicals. The computerized version of the speciation data base system contains correct CAS numbers. The hard copy report, however, is in error due to a bug in the programming used to print the data. The programming bug caused the last digit in the first field of the CAS number to be duplicated automatically as the first digit of the second field of the number after the dash. The user should verify any CAS number in the printed data from other sources. This problem will be corrected in the second edition of the manual to be published in the near future.

SECTION 1

INTRODUCTION

The U. S. Environmental Protection Agency (EPA) has several ongoing activities that require speciated particulate matter (PM) and volatile organic compound (VOC) profiles from several source categories. Some of these activities include receptor modeling, preparation of acid precipitation and air toxics emission inventories, acid precipitation modeling studies, and ozone strategy development.

As part of an effort to update the available speciated VOC and PM profile data bases, EPA has conducted studies to update the "Volatile Organic Compound Species Data Manual - Second Edition" (EPA-450/4-80-015) and the "Receptor Model Source Composition Library" (EPA-450/4-85-002). These updates produced two new species profile documents entitled "Air Emissions Species Manual - Volume I, Volatile Organic Compound Species Profiles" (EPA-450/2-88-003a) and "Air Emissions Species Manual - Volume II, Particulate Matter Species Profiles" (EPA-450/2-88-003b).

The principal objective of the current study was to update the profiles in the Air Emissions Species Manual, Volume II with new information obtained from contacts with principal researchers in the fields of PM speciation and source receptor modeling. The new profiles were developed using the procedures and protocols specified in the Air Emission Species Manual, Volume II. These profiles are based on data voluntarily submitted by the researchers.

Composition data are reported for four size ranges: 0-2.5 um, 2.5-10 um, 0-10 um, and total particulate measured. In addition, uncertainties associated with composition data of each size interval are reported when available. The size interval 0-10 um is of particular interest in PM_{10} source apportionment studies and in modeling efforts under the National Acid Precipitation Assessment Program (NAPAP). When data for the 0-10 um interval were not reported by the sources listed, they were calculated from data for the 0-2.5 um and 2.5-10 um intervals according to procedures outlined in the Air Emissions Species Manual, Volume II (refer to Appendix A). Uncertainty values for the 0-10 um size range were also calculated, when sufficient data were available, based on the methodology discussed in the Air Emissions Species Manual, Volume II (see Appendix A). Appendix A also contains a procedure that may be used to estimate composition data for the 2.5-6 um and 6-10 um size intervals from data for the 2.5-10 um size interval.

In addition to the composition data, mass fraction data (i.e., fraction of mass of particulate emissions within a given size range) are also presented in the profiles. These data are provided for the following size intervals: 0-2.5 um, 0-6 um, and 0-10 um. About 60 percent of the mass fraction data were obtained from AP-42 (see Appendix B).

This update includes 158 new PM profiles representing 14 source categories. Profiles were developed for two new source categories, metal fabrication and construction, which were not covered in the Air Emissions Species Manual, Volume II.

Each profile in this update was assigned the SCC or area source code considered appropriate for the specific profile, based on engineering judgement. Profile assignments were not made for all SCC's. This approach differs from that followed in the Air Emissions Species Manual, Volume II, which assigned profiles to all SCC's. Also, the Air Emissions Species Manual, Volume II developed industry-specific average profiles from the profiles available for each source category. This update does not develop average profiles but reports only the composite profiles developed by the references listed.

To provide the user/reader with guidance on the overall quality of data contained in a given profile, each profile is ranked A, B, C, D, or E, similar to the ranking scheme used in AP-42. The overall quality ratings reflect the uncertainties associated with composition data, mass fraction data, calculational procedures (associated with the 0-10 um range), and assumptions about the composition of size fractions to fill data gaps. A more detailed discussion on profile data quality is contained in Section 2.

A secondary objective of the current study was to add eight new VOC profiles to the VOC species data base. These eight new profiles were developed based on recent testing of oil production operations by the Tulsa City-County Health Department in Oklahoma. The Tulsa Health Department provided the data to EPA for use in the VOC species profile data base. The oil production operations testing program evaluated emissions of 30 light-ends organics emitted from oil well heads and oil field crude oil storage tanks. The procedures and formats for VOC profiles specified in the "Air Emissions Species Manual - Volume I, VOC Species Profiles" were used to develop profiles from the Tulsa test data. A detailed description of all data fields reported for each profile is given in Section 4.

A third objective of this document is to present revisions that have been made to three existing VOC profiles (EPA-450/2-88-003a). Revisions were necessary to correct compound assignment errors caused by coelution of compounds during gas chromatography analyses. The affected profiles are for light-duty gasoline vehicles and are numbered 1101, 1203, and 1204. Additional documentation on the derivation of mobile source profiles is provided in Appendix E.

This Addendum also has the purpose providing the VOC Species Manual user with the notification that the printed version of the existing manual, "Air Emissions Species Manual - Volume I, Volatile Organic Compound Species Profiles" (EPA-450/2-88-003a), contains erroneous CAS numbers for several chemicals. The computerized version of the speciation data base system contains correct CAS numbers. The hard copy report, however, is in error due to a bug in the programming used to print the data. The programming bug caused the last digit in the first field of the CAS number to be duplicated automatically as the first digit of the second field of the number after the dash. Examples are shown below:

624-46-6
109-96-0
760-02-3

The user should verify any CAS number in the printed VOC speciation manual (EPA-450/2-88-003a) with data from other sources. This problem will be corrected in the second edition of the manual to be published in the near future.

This document is divided into five sections. Section 1 contains this introduction. Section 2 describes the PM species profile format and discusses the applicability of PM profiles. Section 3 contains the PM profiles for both point and area sources. Section 4 contains a description of the VOC species profile format and a discussion of the applicability of VOC profiles. The new and revised VOC profiles are presented in Section 5.

There are five appendices that provide additional information.

Appendix A - PM Profile Calculations
Appendix B - Particle Size Distribution Data
Appendix C - Assignment of Source Classification and Area Source Codes by Profile Number
Appendix D - PM Profile Compositing Procedure
Appendix E - Documentation of the Mobile Sources Profile Development Procedures

SECTION 2

SPECIES PROFILE FORMAT AND APPLICATION

2.1 PM SPECIES PROFILE FORMAT

Table 2-1 is an example of the format used in presenting the PM profiles in this document. Composition data and uncertainty information are reported for size intervals 0-2.5 um, 2.5-10 um, 0-10 um, and total particulate measured. The size interval 0-10 um is of particular interest in PM_{10} source apportionment studies and in modeling and emission inventory preparation efforts under NAPAP.

Particle size distribution data (i.e., fraction of mass in a given size interval) are also included in the profiles in this document. The particle size distribution data can be used in estimating size-specific particulate emission rates in preparation of emission inventories. When combined with the composition data from the profiles, these data can be used to estimate size-specific and speciated particulate emission rates.

The profile ratings used in the Air Emissions Species Manual, Volume II are adopted as data quality indicators. These ratings take into account the uncertainties associated with mass fraction data, calculational procedures used for the 0-10 um size interval, and assumptions used in filling data gaps. Each entry in Table 2-1 is described below:

Profile Name: The profile name is the descriptor used for the applicable source category.

Profile Number: This is a unique number assigned to each profile. The same numbering scheme used in the Air Emissions Species Manual, Volume II is followed in this update. Profiles are coded into four groups as follows: combustion sources (10000 series), industrial processes (20000 series), mobile sources (30000 series), and area sources (40000 series). Composite profiles developed during this

TABLE 2-1. SAMPLE PROFILE

PM Profile Speciation Report

Profile Name : Diammonium Phoshate Plant
Profile Number : 25411
Data Quality : D

Control Device : Uncontrolled(a)
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30103001, 30103002, 30103003, 30103004

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.300	0.620	0.930

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured	
CAS Number	No	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-41-7	4	Be	0.000	0.023	NR	0.000	NE	0.000	NR	0.000
7440-42-8	5	B	0.092	0.092	NR	0.000	NE	0.000	NR	0.000
7782-41-4	9	F	0.000	0.092	NR	0.000	NE	0.000	NR	0.000
7440-23-5	11	Na	0.270	0.900	NR	0.000	NE	0.000	NR	0.000
7439-95-4	12	Mg	0.023	0.012	NR	0.000	NE	0.000	NR	0.000
7429-90-5	13	Al	1.103	0.221	3.561	0.890	2.693	0.555	1.330	0.332
7440-21-3	14	Si	25.806	5.161	39.441	9.860	34.629	6.424	27.063	6.766
7723-14-0	15	P	0.725	0.145	4.541	1.337	3.194	0.816	1.077	0.269
7704-34-9	16	S	4.687	0.937	5.327	1.332	5.101	0.912	4.746	1.187
7782-50-5	17	Cl	5.868	1.174	4.271	1.068	4.835	0.829	5.721	1.430
7440-09-7	19	K	0.602	0.120	2.105	0.526	1.575	0.329	0.741	0.185
7440-70-2	20	Ca	0.617	0.123	6.520	1.630	4.437	1.000	1.162	0.290
7440-32-6	22	Ti	0.020	0.004	0.199	0.056	0.136	0.037	0.037	0.009
7440-62-2	23	V	0.042	0.008	0.035	0.026	0.037	0.017	0.041	0.010
7440-47-3	24	Cr	0.006	0.003	0.000	0.025	0.002	0.015	0.006	0.005
7439-96-5	25	Mn	0.024	0.005	0.151	0.042	0.106	0.029	0.036	0.009
7439-89-6	26	Fe	0.925	0.185	3.551	0.888	2.624	0.551	1.168	0.292
7440-48-4	27	Co	0.000	0.210	NR	0.000	NE	0.074	NR	0.000
7440-02-0	28	Ni	0.013	0.004	0.000	0.028	0.005	0.017	0.011	0.006
7440-50-8	29	Cu	0.023	0.005	0.251	0.066	0.171	0.043	0.044	0.011
7440-66-6	30	Zn	0.096	0.019	0.091	0.041	0.093	0.028	0.096	0.024
7440-55-3	31	Ga	0.001	0.002	0.000	0.018	0.000	0.011	0.001	0.004
7440-38-2	33	As	0.019	0.009	0.000	0.064	0.007	0.038	0.018	0.014
7782-49-2	34	Se	0.000	0.003	0.000	0.027	0.000	0.016	0.000	0.005
7726-95-6	35	Br	0.022	0.004	0.000	0.029	0.008	0.017	0.020	0.006
7440-17-7	37	Rb	0.000	0.003	0.000	0.034	0.000	0.020	0.000	0.006
7440-24-6	38	Sr	0.015	0.004	0.229	0.062	0.153	0.041	0.003	0.008
7440-65-5	39	Y	0.000	0.005	0.000	0.049	0.000	0.029	0.000	0.009
7440-67-7	40	Zr	0.011	0.021	0.000	0.212	0.004	0.126	0.010	0.038
7439-98-7	42	Mo	0.028	0.015	0.334	0.172	0.226	0.105	0.056	0.029
7440-05-3	46	Pd	0.011	0.011	0.340	0.150	0.224	0.092	0.041	0.023
7440-22-4	47	Ag	0.000	0.020	0.077	0.220	0.050	0.131	0.007	0.038
7440-43-9	48	Cd	0.000	0.027	0.439	0.320	0.284	0.192	0.041	0.053

TABLE 2-1. SAMPLE PROFILE (Continued)

PM Profile Speciation Report - continued (profile 25411)

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured	
CAS Number	No	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-74-6	49	In	0.012	0.030	0.000	0.302	0.004	0.180	0.011	0.055
7440-31-5	50	Sn	0.000	0.037	0.000	0.390	0.000	0.232	0.000	0.070
7440-36-0	51	Sb	0.000	0.064	0.000	0.675	0.000	0.402	0.000	0.120
7440-39-3	56	Ba	0.000	0.172	0.000	1.810	0.000	1.077	0.000	0.323
7439-91-0	57	La	0.000	0.239	4.411	2.769	2.854	1.656	0.407	0.462
7439-97-6	80	Hg	0.005	0.005	0.000	0.037	0.002	0.022	0.047	0.076
7439-92-1	82	Pb	0.081	0.016	0.194	0.105	0.154	0.065	0.091	0.023
	203	SO4	3.220	0.810	NR	0.000	NE	0.000	NR	0.000
	204	NO3	3.780	0.950	NR	0.000	NE	0.000	NR	0.000
TOTALS:			48.147		76.068		63.608		44.032	

(a) No control specified; thus, assumed uncontrolled.

(b) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

study from individual profiles are assigned profile numbers in the same series. For example, the profile Paved Road Dust - SCAB Composite is developed from Profiles 41123, 41124, and 41131-41135 and assigned the number 41136.

Profile Data Quality: The data quality ratings include the data quality associated with size distribution data and any assumptions associated with developing the composition data for the 0-10 um size interval and filling data gaps. The guidelines used in assigning data quality indicators are somewhat subjective.

It was assumed that the procedures for calculating composition data for the 0-10 um size interval using mass fraction data would lower the overall profile data quality by one level. Additional assumptions about missing data (e.g., no data reported for the 0-2.5 um size interval) would also lower the data quality by one or two levels. For example, for Profile 11210 (Coal-Fired Power Plant), composition data for the 0-2.5 um and 2.5-10 um size intervals were not reported. To fill these two data gaps, it was assumed that the composition data for these two intervals are the same as that for the total particulate measured. Thus, the data quality assigned to Profile 11210 in this document was "E." Specifically, each data quality indicator represents the following:

Data Quality A: Composition and mass fraction data obtained for the size intervals 0-2.5 um, 2.5-10 um, and total particulate measured from several sources using sound sampling and analytical methodology. Profiles are considered representative and recommended for use.

Data Quality B: Composition and mass fraction data obtained for the size intervals 0-2.5 um, 2.5-10 um, and total particulate measured from a few sources using a generally sound methodology.

Data Quality C: Composition data obtained for the size intervals 0-2.5 um, 2.5-10 um, and total particulate measured from a few sources using a generally sound methodology and mass fraction data of below average quality; or composition data obtained for two of the three size intervals 0-2.5 um, 2.5-10 um, and total particulate measured from a large number of sources using a sound methodology coupled with mass fraction data of below average quality.

Data Quality D: Composition data obtained for size intervals 0-2.5 um, 2.5-10 um, and total particulate measured obtained from a limited number of sources using uncertain or undocumented methodology coupled with mass fraction data of average or below average quality; or composition data obtained for two of the three size intervals 0-2.5 um, 2.5-10 um, and total particulate measured from a few sources using a generally sound methodology coupled with mass fraction data of poor quality.

Data Quality E: Composition data obtained for the size intervals 0-2.5 um, 2.5-10 um, and total particulate measured from a single source using poorly documented methodology coupled with mass fraction data of poor quality; or composition data obtained for two of the three size intervals 0-2.5 um, 2.5-10 um, and total particulate measured from a limited number of sources using poorly documented methodology coupled with mass fraction data of poor quality; or composition data obtained for one of the three size intervals 0-2.5 um, 2.5-10 um, and total particulate measured coupled with mass fraction data of poor quality; or industry-specific average profiles; profiles with "E" rating are recommended for use only if there is no other information available.

Control Device: This entry is used to indicate if the profile data represent emissions downstream or upstream of a control device (if present). The downstream composition and size distribution of particulate emissions would be affected by the presence of a control device.

Reference(s): This entry identifies the primary reference(s) used in development of the profiles. If more detailed information is required about the data contained in the profile, the user/reader should consult these reference(s).

Data Source: This entry briefly describes the basis of the composition data used in the profile (e.g., number of tests, sources and samples, sampling and analytical methods, how data were composited, etc.). More detailed information about the data used can be obtained from the references indicated in the profile.

SCC: This entry is the code for the source category for which the profile was originally developed. These codes are obtained from NEDS for point sources (1-01-001-01 through 5-03-900-10) and area sources (01 through 64). Area source codes from 65 through 115 developed under NAPAP are also considered.

Mass Fraction Data: Size distribution data (i.e., the fraction of mass [particulate emissions] contained within a specific size range) are reported in this entry. Three size ranges are considered: 0-2.5 um, 0-6 um, and 0-10 um. When composition data for the 0-10 um interval were not reported, mass fraction data for 0-2.5 um and 0-6 um size ranges were used to estimate composition data for the 0-10 um size range.

Mass fraction data for the 0-6 um interval are presented as additional information. A large portion of the mass fraction data was obtained from AP-42. A detailed description of the mass fraction data (how data were compiled, data quality, references, etc.) used in this document is included in Appendix B.

One area of concern is that the mass distribution data and the source profiles used to estimate the composition of the 0-10 um size range are not from the same data set and represent data collected from different emission sources. This introduces an additional source of uncertainty when composition data for the 0-10 um size interval are not reported and must be calculated.

Species Identification: Each specie in the profile data is identified by a species number, species name, and CAS number. In general, the species number is the atomic number for the element. Other species are arbitrarily assigned the numbers starting with 200 (e.g., total carbon - 200; organic carbon - 201; elemental carbon - 202; sulfate ion - 203, etc.). The CAS numbers for the species were obtained from the Registry of Toxic Effects of Chemical Substances (1983 Supplement to the 1981-82 edition).

The format for the species listed in the profiles in this update varies somewhat from the format used in the Air Emission Species Manual, Volume II. The profiles in this document include only those species for which data are reported in the references given.

Composition Data: In a typical profile, composition data expressed as weight percent are presented for four size ranges: 0-2.5 um, 2.5-10 um, 0-10 um, and total particulate measured. These data were extracted directly from the reference(s) listed when available. For many profiles, data for the 0-10 um size interval were derived from calculations based on the methodology described in the Air Emissions Species Manual, Volume II (refer to Appendix A). In these profiles, a footnote indicates that the data are based on calculations described in Appendix A.

In some cases, profile data were not complete (i.e., data were only reported for one or two size intervals). In these cases, engineering judgement was used to fill the data gaps. For example, in Profile 11210 (Coal-Fired Power Plants), composition data are reported only for the total particulate measured. In absence of other information, it was assumed that the composition data for the 0-2.5 um, 2.5-10 um, and 0-10 um size intervals were the same as that for the total particulate measured. This assumption is indicated by footnote (a) for these three size intervals. The following symbols are used in the composition data: NR (not reported) and NE (not estimated). The NE symbol is used in cases where a specific calculation could not be carried out due to missing data.

Following the data tabulation, the percent of mass accounted for by the composition data under each size interval is presented. This value is based on the summation of weight percentages of the species in a given column. The sum does not include oxygen, hydrogen, nitrogen, water, or other components that were not included in the analysis. In some profiles, the summation of weight percentages may be greater than 100 due to double counting (e.g., sulfur/sulfate, total carbon/elemental carbon/organic carbon, etc.). Failure to include the carbonaceous, oxygen, and hydrogen components in the aerosol characterization is often the largest source of unexplained mass.

Since the composition data in weight percentages are associated with a specific size interval, it is not possible to add the percentages for a particular species across size intervals. For example, in Table 2-1, the percentages for Al in the 0-2.5 um, 2.5-10 um, and 0-10 um size intervals are 0.230, 5.200, and 1.799; and $0.230 + 5.200 \neq 1.799$.

Uncertainty: The uncertainty associated with composition data for the size ranges 0-2.5 um, 2.5-10 um, and the total particulate measured are based on either the estimated analytical precision of the measurement (single sample) or the standard deviation of the data sets. For some profiles, the uncertainty associated with the 0-10 um size range is calculated according to the procedure outlined in the Air Emissions Species Manual, Volume II (refer to Appendix A). As Table 2-1 shows, footnotes indicate whether they are based on actual data (i.e., extracted from the listed reference) or calculated. In many cases, uncertainties were either not reported or not known by the authors. The abbreviations used for uncertainty values include NR and NE.

Date: This entry will be used to indicate the date the profile was last reviewed/updated by EPA.

2.2 LIMITATIONS OF DATA

As indicated in the Air Emissions Species Manual, Volume II, the reader/user should be aware of the limitations of each data set, specifically with respect to measurements of carbonaceous emissions and volatile elements (e.g., Pb, As, Hg, etc.) that partially exist in the gaseous phase at high stack temperatures. Unless special precautions such as dilution source sampling, aircraft, or balloon methods are exercised, these components will not be accurately represented in the data. In addition, many of the studies from literature do not report a sufficiently broad range of particulate matter components to account for the majority of the mass, typically due to the specific sampling and analytical protocols employed. Therefore, studies that use these source profiles (e.g., receptor modeling) may be unable to apportion all of the ambient aerosol mass accurately. Thus, the user/reader is cautioned to use these profiles with discretion. The profile data should be carefully reviewed to ensure that they represent the sources being studied reasonably well.

When composition data for the 0-10 um size interval were calculated, size distribution data were combined with composition data reported for the 0-2.5 um and 2.5-10 um size intervals. The size distribution data and the composition data from the source profiles represent data collected from different emission sources. Therefore, this introduces an additional source of uncertainty in calculating composition data for the 0-6 um size interval.

In several profiles, composition data information for one or two size intervals were not reported. To increase the usefulness of the profiles, certain assumptions were employed to fill these data gaps.

- If data were reported for a single size interval, it was assumed that data for the other two intervals were the same. Values for the 0-10 um size interval were also assumed to be the same.

- If data for the 0-2.5 um size interval were missing, it was assumed the data for the 2.5-10 um size interval could be substituted and vice versa. Values for the 0-10 um size interval were also assumed to be the same.

- If data for the total particulate measured were not reported, assume the estimated data for the 0-10 um size fraction can be substituted.

Since the chemical composition of particulate emissions of many sources is a function of particle size, application of data based on total particulate measured to particulate mass in the fine particle fraction (0-2.5 um) or coarse particle fraction (2.5-10 um) may affect the validity of the analysis. Where such an assumption is made, it is indicated with a footnote in the profile.

As pointed out in the Air Emission Species Manual, Volume II, the user/reader should be aware of the potential variability in the chemical composition of emissions, both within a source group and between similar sources. Due to limited availability of high-quality, size-resolved profile data sets, an indepth evaluation of the magnitude of profile variability is not possible. However, comparisons of profiles in the literature based on the total particulate measured indicate that profile variability is dependent on the chemical composition of fuels or process materials, volatility, and sampling and analytical procedures.

Profiles for individual sources may vary considerably from the values provided in this document. Therefore, source-specific data from local sources are preferable to the use of literature data and are recommended, particularly for regulatory applications. Nevertheless, preliminary analyses based on source profiles in this document may be adequate to meet a number of objectives. The reader/user must ultimately assess whether the data in the document are appropriate for use in any particular application.

2.3 PM SPECIES PROFILE APPLICATION

There are several ongoing EPA activities that require speciated PM data as an input parameter. These activities include preparation of air toxics emission inventories, receptor modeling, preparation of acid precipitation inventories, and acid precipitation modeling studies. This section provides a specific example to illustrate how to use PM species profiles in preparation of an air toxics emission inventory.

2.3.1 Document Guide

Appendix C provides a list of the point and area sources covered by the profiles in Section 3. To identify the applicable profile for a given source category, the user/reader should refer to Appendix C. The location of the profile can then be determined using the profile number and the profile list presented in Section 3.

2.3.2 Example of Use of a Profile

A hypothetical example will be used to describe how profiles might be applied: a State air pollution control agency is developing an air toxics emission inventory for the State. An earlier study conducted for the State has identified a list of potentially toxic species from several emission sources. The emission rates of these individual species will be used as an input to the proposed air toxics regulatory program for the State. The proposed program advocates regulating particulate species in the fine fraction (i.e., <2.5 um).

The PM profiles can identify the relative amounts of individual particulate species within specified size intervals in a given emission stream. In most cases, emission factors are available for total particulate matter where the elemental breakdown is not specified (e.g., AP-42, Criteria Pollutant Emission Factor Document).[1,2] The information contained in this document supplements the general emissions data in AP-42 or the Criteria Pollutant Emission Factor Document. For a given source category, the appropriate PM species profile should be identified using Appendix C and the total particulate emission factor should be multiplied by the weight fractions for each species in a given size interval, as given in the profile, to determine size-specific individual emission factors.

In this example, arsenic is one of the species on a State's list and emissions from a municipal waste incinertor are of concern. The incinerator burns routine residential and commercial refuse and is uncontrolled. Since the species profiles are keyed off of SCC, the first task is to determine the SCC for the municipal waste incinerator. The SCC and PM emission factor for a specific category can be obtained from the National Emissions Data System (NEDS) or the Criteria Pollutant Emission Factor Document. These materials would indicate that the appropriate SCC for municipal incinerators is 5-01-001-01. The reader/user can then refer to the SCC/profile list in Appendix C to identify which profiles correspond to the subject SCC. For 5-01-001-01, two profiles, 17107 and 17108, are listed in Appendix C and the document page numbers of each are given. At this point, the reader/user should review both of the candidate profiles to see which corresponds to the particular source in question. A review of the "Control Device" field shows that there is only one profile for uncontrolled incincerators. This would be Profile 17108. A review of the "Species" field indicates that arsenic is contained in the profile. If there had been more than one profile applicable to this situation, the reader/user could have consulted the "Data Source" field for more refined information on which to make a profile selection, or the original references(s) on which the profiles were based could be consulted. In cases with multiple potentially applicable profiles, the "Data Quality" field may also be useful in selecting the most preferred profile.

In Profile 17108, the weight percentage of cadmium (Cd) under the "0-2.5 um" column is 0.110 and the fraction of mass associated with this size interval is 0.26. Applying the weight fraction of cadmium to the total particulate emissions of 1,500,000 lb/yr for the incinerator, cadmium emissions in the fine fraction are estimated as 1,500,000 x 0.0011 x 0.26 = 429 lb/yr. The uncertainty associated with the cadmium weight percentage is reported as 0.060 percent in the profile. From this information, a range for cadmium emissions can be specified as follows:

$$1{,}500{,}000 \times 0.26 \times (0.0011 - 0.0006) = 195 \text{ lb/yr}$$
$$1{,}500{,}000 \times 0.26 \times (0.0011 + 0.0006) = 663 \text{ lb/yr}$$

Thus, the annual cadmium emissions in the 0-2.5 um size range may be expected to range from 195 to 663 lb/yr, with a mean of 429 lb/yr.

2.4 REFERENCES FOR SECTION 2

1. U. S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, AP-42. Fourth Edition. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. September 1985; Supplement A, October 1986; Supplement B, September 1988.

2. U. S. Environmental Protection Agency. Criteria Pollutant Emission Factors for the 1985 NAPAP Emissions Inventory. EPA-600/7-87-015. Office of Research and Development, Air and Energy Engineering Research Laboratory, Research Triangle Park, North Carolina. May 1987.

SECTION 3

PM SPECIES PROFILES - POINT AND AREA SOURCES

This section contains the 158 PM profiles grouped in 14 separate subsections according to source categories. The profiles representing point sources are presented first, followed by those representing area sources. The following list can be used to identify and locate the profiles for each source category group. Individual profiles within each source category group are presented in numerical order.

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3.1 EXTERNAL COMBUSTION BOILERS

External combustion sources include utility, industrial, commercial and institutional boilers; commercial and domestic combustion units; process heaters, furnaces, and kilns. Coal, oil, and natural gas are the major fossil fuels used by these sources.

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PM Profile Speciation Report

Profile Name : Coal-Fired Power Plant
Profile Number : 11202
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,2
Data Source : Data taken from Reference 1. For details, consult Reference 2.

SCC Assignments: 10100201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.060	0.170	0.230

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.300	0.020	0.410	0.020	0.381	0.021	0.382	0.020
7429-90-5	13	Al	13.400	1.500	18.400	2.700	17.096	1.591	17.104	2.114
7440-21-3	14	Si	21.800	1.600	18.500	2.800	19.361	1.761	19.356	2.246
7723-14-0	15	P	0.620	0.060	0.220	0.040	0.324	0.035	0.324	0.038
7704-34-9	16	S	3.400	0.600	0.540	0.070	1.286	0.204	1.282	0.189
7782-50-5	17	Cl	0.020	0.011	0.103	0.005	0.081	0.006	0.082	0.005
7440-09-7	19	K	1.200	0.090	1.330	0.080	1.296	0.075	1.296	0.078
7440-70-2	20	Ca	1.400	0.500	2.300	0.300	2.065	0.217	2.067	0.265
7440-22-2	21	Sc	0.004	0.000	0.004	0.000	0.004	0.001	0.004	0.000
7440-32-6	22	Ti	1.100	0.100	1.300	0.200	1.248	0.119	1.248	0.157
7440-62-2	23	V	0.051	0.014	0.043	0.009	0.045	0.007	0.045	0.008
7440-47-3	24	Cr	0.036	0.012	0.019	0.001	0.023	0.004	0.023	0.003
7439-96-5	25	Mn	0.028	0.001	0.022	0.001	0.024	0.002	0.024	0.001
7439-89-6	26	Fe	7.200	0.400	8.100	0.400	7.865	0.411	7.867	0.418
7440-48-4	27	Co	0.009	0.001	0.008	0.000	0.008	0.001	0.008	0.001
7440-02-0	28	Ni	0.038	0.005	0.032	0.002	0.034	0.003	0.034	0.002
7440-50-8	29	Cu	0.029	0.002	0.024	0.001	0.025	0.002	0.025	0.001
7440-66-6	30	Zn	0.039	0.005	0.028	0.002	0.031	0.003	0.031	0.002
7440-55-3	31	Ga	NR	0.000	0.016	0.006	NE	0.000	0.012	0.005
7440-38-2	33	As	0.061	0.008	0.020	0.007	0.031	0.005	0.031	0.006
7782-49-2	34	Se	0.024	0.002	0.002	0.000	0.008	0.001	0.008	0.001
7726-95-6	35	Br	0.003	0.001	0.001	0.001	0.001	0.000	0.001	0.001
7440-17-7	37	Rb	0.018	0.008	0.012	0.001	0.013	0.003	0.013	0.002
7440-24-6	38	Sr	0.129	0.006	0.123	0.025	0.125	0.015	0.125	0.019
7440-67-7	40	Zr	0.063	0.014	0.042	0.014	0.047	0.009	0.047	0.011
7439-98-7	42	Mo	0.017	0.006	0.007	0.001	0.010	0.002	0.010	0.002
7440-46-2	55	Cs	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-39-3	56	Ba	0.300	0.190	0.094	0.016	0.148	0.052	0.147	0.051
7439-91-0	57	La	0.011	0.001	0.013	0.001	0.013	0.002	0.013	0.001
7440-45-1	58	Ce	0.017	0.001	0.019	0.001	0.018	0.002	0.018	0.001
7440-00-8	60	Nd	0.007	0.002	0.007	0.001	0.007	0.001	0.007	0.001
7440-19-9	62	Sm	0.002	0.000	0.003	0.000	0.002	0.001	0.002	0.000
7440-53-1	63	Eu	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-54-2	64	Gd	NR	0.000	0.004	0.002	NE	0.000	0.003	0.001
7440-27-9	65	Tb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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PM Profile Speciation Report - continued (profile 11202)

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-64-4	70	Yb	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7439-94-3	71	Lu	NR	0.000	0.000	0.000	NE	0.000	0.000	0.000
7440-58-6	72	Hf	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-25-7	73	Ta	NR	0.000	0.000	0.000	NE	0.000	0.000	0.000
7440-33-7	74	W	0.002	0.001	0.001	0.000	0.002	0.001	0.002	0.000
7439-92-1	82	Pb	0.041	0.004	0.026	0.001	0.030	0.003	0.030	0.002
7440-29-1	90	Th	0.002	0.000	0.003	0.000	0.003	0.001	0.003	0.000
	201	OC	0.890	0.120	2.000	0.100	1.710	0.088	1.712	0.095
	203	SO4	11.900	0.600	2.400	0.200	4.878	0.482	4.863	0.397
TOTALS:			64.165		56.180		58.247		58.253	

(1) No control specified; thus, assumed uncontrolled.

(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Coal-Fired Power Plant
Profile Number : 11203
Data Quality : C

Control Device : Cyclonic Precipitator
Reference(s) : 3,4
Data Source : Sampled with an Andersen impactor. Analyzed using AAS, dc AES, X-ray spectrometry, and spark-source MS.

SCC Assignments: 10100201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.610	0.840	0.930

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um(1) %wt	0-10 um(1) unc	Total Measured %wt	Total Measured unc
7440-41-7	4	Be	0.006	0.000	0.004	0.000	0.005	0.005	0.005	0.000
7439-95-4	12	Mg	0.463	0.093	1.064	0.213	0.804	0.157	0.958	0.192
7429-90-5	13	Al	13.600	2.720	18.948	3.790	16.633	2.998	18.004	3.601
7440-21-3	14	Si	27.000	5.400	31.714	6.394	29.674	5.273	30.882	6.176
7704-34-9	16	S	40.933	2.047	11.096	0.555	24.011	2.735	16.362	0.818
7440-09-7	19	K	3.400	0.170	4.653	0.233	4.111	0.342	4.432	0.222
7440-70-2	20	Ca	3.400	0.170	4.653	0.233	4.111	0.342	4.432	0.222
7440-32-6	22	Ti	1.247	0.062	1.182	0.059	1.210	0.111	1.193	0.060
7440-62-2	23	V	0.050	0.008	0.026	0.004	0.036	0.010	0.030	0.005
7440-47-3	24	Cr	0.353	0.071	0.069	0.014	0.192	0.044	0.119	0.024
7439-96-5	25	Mn	0.050	0.002	0.020	0.001	0.033	0.009	0.025	0.001
7439-89-6	26	Fe	15.667	3.133	13.741	2.748	14.575	2.530	14.081	2.816
7440-48-4	27	Co	0.013	0.004	0.008	0.002	0.010	0.005	0.009	0.003
7440-02-0	28	Ni	0.173	0.035	0.054	0.011	0.106	0.025	0.075	0.015
7440-50-8	29	Cu	0.030	0.006	0.034	0.007	0.032	0.008	0.033	0.007
7440-66-6	30	Zn	1.300	0.390	0.838	0.251	1.038	0.255	0.919	0.276
7440-38-2	33	As	0.180	0.036	0.089	0.018	0.128	0.027	0.106	0.021
7782-49-2	34	Se	0.007	0.001	0.002	0.000	0.004	0.003	0.003	0.001
7440-43-9	48	Cd	0.004	0.001	0.002	0.000	0.003	0.002	0.002	0.000
7440-31-5	50	Sn	0.002	0.000	0.001	0.000	0.001	0.002	0.001	0.000
7440-36-0	51	Sb	0.006	0.002	0.003	0.001	0.004	0.003	0.003	0.001
7440-28-0	81	Tl	0.008	0.002	0.005	0.002	0.006	0.004	0.006	0.002
7439-92-1	82	Pb	0.163	0.033	0.135	0.027	0.147	0.029	0.140	0.028
	200	TC	0.640	0.128	0.669	0.134	0.656	0.118	0.664	0.133
TOTALS:			108.695		89.010		97.530		92.484	

(1) Calculated based on methodology in the Air Emissions Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Coal-Fired Power Plant
Profile Number : 11204
Data Quality : C

Control Device : ESP
Reference(s) : 3,5
Data Source : Sampled with a SASS train. Analyzed using XRF, INAA, and FAA.

SCC Assignments: 10100201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.290	0.500	0.670

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um(1) %wt	0-10 um(1) unc	Total Measured %wt	Total Measured unc
7440-23-5	11	Na	0.996	0.286	0.853	0.200	0.915	0.197	0.864	0.186
7429-90-5	13	Al	11.567	6.345	11.597	4.237	11.584	4.010	11.579	3.947
7440-21-3	14	Si	17.795	9.090	22.000	7.996	20.180	6.728	21.683	7.426
7704-34-9	16	S	3.959	1.521	1.126	0.420	2.352	0.759	1.339	0.405
7440-09-7	19	K	1.954	0.442	1.740	0.311	1.833	0.318	1.756	0.289
7440-70-2	20	Ca	6.495	1.191	8.418	1.100	7.586	1.043	8.273	1.022
7440-22-2	21	Sc	0.002	0.000	0.002	0.000	0.002	0.002	0.002	0.000
7440-32-6	22	Ti	0.906	0.227	0.702	0.157	0.790	0.160	0.717	0.146
7440-47-3	24	Cr	0.027	0.009	0.018	0.003	0.022	0.008	0.019	0.003
7439-96-5	25	Mn	0.097	0.027	0.077	0.017	0.086	0.021	0.078	0.016
7439-89-6	26	Fe	10.445	1.393	10.754	0.995	10.620	1.196	10.731	0.926
7440-48-4	27	Co	0.004	0.001	0.003	0.001	0.003	0.002	0.003	0.001
7440-02-0	28	Ni	0.017	0.003	0.011	0.001	0.014	0.005	0.012	0.001
7440-50-8	29	Cu	0.014	0.004	0.009	0.002	0.011	0.005	0.009	0.002
7440-66-6	30	Zn	0.225	0.029	0.136	0.013	0.175	0.027	0.143	0.013
7440-55-3	31	Ga	0.013	0.004	0.006	0.002	0.009	0.005	0.007	0.001
7440-56-4	32	Ge	0.018	0.005	0.012	0.003	0.015	0.006	0.013	0.003
7440-38-2	33	As	NR	0.000	0.005	0.001	NE	0.000	NR	0.000
7782-49-2	34	Se	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000
7726-95-6	35	Br	NR	0.000	0.000	0.000	NE	0.000	NR	0.000
7440-17-7	37	Rb	0.014	0.002	0.010	0.001	0.012	0.004	0.010	0.001
7440-24-6	38	Sr	0.148	0.021	0.135	0.019	0.141	0.023	0.136	0.018
7440-43-9	48	Cd	NR	0.000	0.001	0.000	NE	0.000	NR	0.000
7440-31-5	50	Sn	0.002	0.000	0.002	0.001	0.002	0.002	0.002	0.001
7440-36-0	51	Sb	0.002	0.001	0.002	0.001	0.002	0.002	0.002	0.001
7440-46-2	55	Cs	0.001	0.000	0.001	0.000	0.001	0.001	0.001	0.000
7440-39-3	56	Ba	0.722	0.095	0.410	0.039	0.545	0.074	0.434	0.036
7439-91-0	57	La	0.010	0.003	0.008	0.002	0.009	0.004	0.008	0.002
7440-45-1	58	Ce	0.015	0.005	0.013	0.003	0.014	0.005	0.013	0.003
7440-19-9	62	Sm	0.002	0.000	0.001	0.000	0.001	0.002	0.001	0.000
7440-53-1	63	Eu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-27-9	65	Tb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-64-4	70	Yb	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000
7440-58-6	72	Hf	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-25-7	73	Ta	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

PM Profile Speciation Report - continued (profile 11204)

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-33-7	74	W	0.001	0.000	0.001	0.000	0.001	0.001	0.001	0.000
7439-92-1	82	Pb	0.114	0.016	0.075	0.007	0.092	0.016	0.078	0.007
7440-29-1	90	Th	0.002	0.001	0.002	0.001	0.002	0.002	0.002	0.000
7440-61-1	92	U	0.001	0.000	0.001	0.000	0.001	0.001	0.001	0.000
TOTALS:			55.570		58.132		57.021		57.918	

(1) Calculated based on methodology described in the Air Emission Species Manual, Volume II.

```
PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Coal-Fired Power Plant
Profile Number : 11205
Data Quality   : C
--------------------------------------------------------------------------------
Control Device : ESP
Reference(s)   : 3,6
Data Source    : Plant A sampled with EPA Method 5 and Andersen impactor.
                 Analyzed using XRF and INAA.

SCC Assignments: 10100201

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.290         0.500           0.670
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                               0-2.5 um      2.5-10 um     0-10 um(1)    Measured
                  Species    ------------  ------------  ------------  ------------
 CAS Number      Num   Sym     %wt    unc    %wt    unc    %wt    unc    %wt    unc
--------------------------------------------------------------------------------
  7440-23-5      11    Na    0.168  0.025  0.384  0.059  0.291  0.047  0.316  0.039
  7439-95-4      12    Mg    1.656  0.331  3.770  0.479  2.855  0.399  3.103  0.310
  7429-90-5      13    Al   10.018  1.503 23.103  3.535 17.439  2.687 18.971  2.371
  7440-21-3      14    Si   17.120  2.568 40.031  6.108 30.114  4.637 32.796  4.100
  7704-34-9      16    S     0.501  0.050  0.405  0.135  0.447  0.101  0.435  0.091
  7440-09-7      19    K     1.136  0.170  2.180  0.573  1.728  0.403  1.850  0.389
  7440-70-2      20    Ca    0.575  0.058  0.750  0.215  0.674  0.154  0.146  1.022
  7440-32-6      22    Ti    0.614  0.092  1.435  0.261  1.080  0.193  1.176  0.176
  7440-62-2      23    V     0.051  0.005  0.067  0.009  0.060  0.011  0.062  0.006
  7440-47-3      24    Cr    0.064  0.013  0.065  0.021  0.065  0.018  0.065  0.014
  7439-96-5      25    Mn    0.023  0.003  0.030  0.010  0.027  0.009  0.040  0.006
  7439-89-6      26    Fe    2.330  0.350  3.523  0.708  3.007  0.535  3.146  0.472
  7440-02-0      28    Ni    0.028  0.007  0.017  0.007  0.022  0.008  0.020  0.004
  7440-50-8      29    Cu    0.023  0.003  0.030  0.008  0.027  0.008  0.028  0.006
  7440-66-6      30    Zn    0.039  0.006  0.086  0.026  0.066  0.019  0.071  0.018
  7440-38-2      33    As    0.062  0.009  0.030  0.010  0.044  0.012  0.040  0.006
  7782-49-2      34    Se    0.014  0.004  0.005  0.002  0.009  0.005  0.008  0.001
  7439-92-1      82    Pb    0.016  0.009  0.024  0.008  0.021  0.008  0.022  0.004
--------------------------------------------------------------------------------
TOTALS:                     34.438        75.935        57.976        62.295
================================================================================
(1)  Calculated based on methodology described in the Air Emission  Species Manual,
     Volume II.
```

PM Profile Speciation Report

Profile Name : Coal-Fired Power Plant
Profile Number : 11206
Data Quality : C

Control Device : ESP
Reference(s) : 3,6
Data Source : Plant B sampled with EPA Method 5 and Andersen impactor.
Analyzed using XRF and INAA.

SCC Assignments: 10100201

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.290	0.500	0.670

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.076	0.009	0.146	0.025	0.116	0.021	0.109	0.011
7439-95-4	12	Mg	0.673	0.336	1.649	0.716	1.227	0.501	1.128	0.282
7429-90-5	13	Al	4.093	1.023	10.730	9.702	7.857	6.420	7.189	4.493
7440-21-3	14	Si	6.550	2.129	17.729	15.948	12.890	10.569	11.765	7.353
7704-34-9	16	S	0.199	0.066	0.402	0.634	0.314	0.419	0.294	0.033
7782-50-5	17	Cl	0.051	0.006	0.023	0.022	0.035	0.017	0.038	0.009
7440-09-7	19	K	0.393	0.099	0.927	0.235	0.696	0.169	0.642	0.096
7440-70-2	20	Ca	0.234	0.070	0.373	0.179	0.313	0.125	0.299	0.075
7440-32-6	22	Ti	0.260	0.105	0.589	0.292	0.447	0.201	0.413	0.124
7440-62-2	23	V	0.020	0.014	0.023	0.029	0.022	0.021	0.022	0.011
7440-47-3	24	Cr	0.015	0.017	0.041	0.035	0.030	0.025	0.027	0.014
7439-96-5	25	Mn	0.015	0.014	0.017	0.030	0.016	0.021	0.016	0.012
7439-89-6	26	Fe	0.953	0.238	2.390	0.911	1.768	0.621	1.623	0.406
7440-02-0	28	Ni	0.010	0.008	0.023	0.028	0.017	0.019	0.016	0.012
7440-50-8	29	Cu	0.015	0.014	0.017	0.030	0.016	0.021	0.016	0.012
7440-66-6	30	Zn	0.015	0.014	0.029	0.028	0.023	0.020	0.022	0.011
7440-38-2	33	As	0.015	0.011	0.017	0.029	0.016	0.020	0.016	0.012
7782-49-2	34	Se	0.010	0.007	0.000	0.014	0.004	0.010	0.005	0.005
7439-92-1	82	Pb	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.005
TOTALS:			13.597		35.125		25.807		23.651	

(1) Calculated based on methodology described in the Air Emission Species Manual, Volume II.

```
PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Coal-Fired Power Plant
Profile Number : 11207
Data Quality   : C
--------------------------------------------------------------------------------
Control Device : ESP
Reference(s)   : 3,6
Data Source    : Plant C sampled with EPA Method 5 and Andersen impactor.
                 Analyzed using XRF and INAA.

SCC Assignments: 10100201

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.290         0.500           0.670
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                         Total
                                   0-2.5 um      2.5-10 um    0-10 um(1)     Measured
                 Species         ------------  ------------  ------------  ------------
CAS Number     Num   Sym          %wt    unc    %wt    unc    %wt    unc    %wt    unc
--------------------------------------------------------------------------------
 7440-23-5     11    Na         0.231  0.058  0.366  0.115  0.308  0.084  0.310  0.063
 7439-95-4     12    Mg         2.027  0.507  3.021  0.854  2.591  0.632  2.607  0.451
 7429-90-5     13    Al        12.030  3.308 15.144  4.078 13.796  3.199 13.847  1.939
 7440-21-3     14    Si        21.689  5.422 25.945  6.975 24.103  5.442 24.172  3.379
 7704-34-9     16    S          0.362  0.109  0.327  0.126  0.342  0.101  0.342  0.058
 7440-09-7     19    K          1.420  0.403  1.512  0.437  1.472  0.356  1.473  0.191
 7440-70-2     20    Ca         0.636  0.184  0.562  0.186  0.594  0.156  0.593  0.077
 7440-32-6     22    Ti         0.808  0.173  1.173  0.274  1.015  0.210  1.021  0.143
 7440-62-2     23    V          0.036  0.008  0.036  0.010  0.036  0.010  0.036  0.004
 7440-47-3     24    Cr         0.041  0.014  0.026  0.013  0.032  0.013  0.033  0.005
 7439-96-5     25    Mn         0.028  0.008  0.006  0.013  0.016  0.011  0.015  0.007
 7439-89-6     26    Fe         2.690  1.009  3.192  1.118  2.975  0.884  2.983  0.498
 7440-02-0     28    Ni         0.021  0.004  0.021  0.016  0.021  0.012  0.021  0.009
 7440-50-8     29    Cu         0.027  0.008  0.018  0.010  0.022  0.010  0.022  0.005
 7440-66-6     30    Zn         0.028  0.008  0.028  0.011  0.028  0.010  0.028  0.006
 7440-38-2     33    As         0.034  0.009  0.002  0.007  0.016  0.009  0.015  0.002
 7782-49-2     34    Se         0.006  0.002  0.003  0.002  0.004  0.003  0.004  0.001
 7439-92-1     82    Pb         0.009  0.008  0.036  0.012  0.024  0.009  0.025  0.006
--------------------------------------------------------------------------------
TOTALS:                        42.123        51.418        47.395        47.547
================================================================================
(1)  Calculated based on methodology described in the Air Emission Species Manual,
     Volume II.
```

```
PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Coal-Fired Power Plant
Profile Number : 11208
Data Quality   : E
------------------------------------------------------------------------------
Control Device : ESP
Reference(s)   : 3,7
Data Source    : Samples collected isokinetically using bag filters.Analyzed
                 by AAS and XRF.

SCC Assignments: 10100201

Mass Fraction Data -  Size Interval (um) :    (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :     0.290         0.500           0.670
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                      Total
                                  0-2.5 um(1)  2.5-10 um(1)  0-10 um(1)   Measured
                   Species        -----------  ------------  -----------  -----------
 CAS Number     Num   Sym         %wt    unc   %wt    unc    %wt    unc   %wt    unc
------------------------------------------------------------------------------
  7429-90-5     13    Al        9.200  0.000  9.200  0.000  9.200  0.000  9.200  0.497
  7439-89-6     26    Fe        7.400  0.000  7.400  0.000  7.400  0.000  7.400  0.400
  7440-50-8     29    Cu        0.032  0.000  0.032  0.000  0.032  0.000  0.032  0.005
  7440-66-6     30    Zn        0.037  0.000  0.037  0.000  0.037  0.000  0.037  0.001
  7440-38-2     33    As        0.015  0.000  0.015  0.000  0.015  0.000  0.015  0.000
  7782-49-2     34    Se        0.006  0.000  0.006  0.000  0.006  0.000  0.006  0.001
  7440-17-7     37    Rb        0.006  0.000  0.006  0.000  0.006  0.000  0.006  0.000
  7440-24-6     38    Sr        0.247  0.000  0.247  0.000  0.247  0.000  0.247  0.008
  7440-65-5     39    Y         0.006  0.000  0.006  0.000  0.006  0.000  0.006  0.000
  7440-67-7     40    Zr        0.019  0.000  0.019  0.000  0.019  0.000  0.019  0.001
 74400-30-1     41    Nb        0.002  0.000  0.002  0.000  0.002  0.000  0.002  0.001
  7439-98-7     42    Mo        0.006  0.000  0.006  0.000  0.006  0.000  0.006  0.001
  7440-36-0     51    Sb        0.002  0.000  0.002  0.000  0.002  0.000  0.002  0.000
  7439-92-1     82    Pb        0.013  0.000  0.013  0.000  0.013  0.000  0.013  0.002
------------------------------------------------------------------------------
TOTALS:                        16.991        16.991        16.991        16.991
==============================================================================
(1)  Estimated / extrapolated.
```

```
PM Profile Speciation Report
----------------------------------------------------------------------------------
Profile Name   : Coal-Fired Power Plant
Profile Number : 11209
Data Quality   : E
----------------------------------------------------------------------------------
Control Device : Wet Scrubber
Reference(s)   : 3,7
Data Source    : Samples collected isokinetically using alundum thimbles
                 backed up with wet impingers. Anlyzed by AAS and XRF.

SCC Assignments: 10100201

Mass Fraction Data -  Size Interval (um) :    (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :     0.510         0.620           0.710
----------------------------------------------------------------------------------
Total Particulate Matter -
                                                                         Total
                                0-2.5 um(1)  2.5-10 um(1)   0-10 um(1)   Measured
                 Species       ------------ ------------ ------------ ------------
 CAS Number   Num  Sym          %wt    unc    %wt    unc    %wt    unc    %wt    unc
----------------------------------------------------------------------------------
  7429-90-5   13   Al         7.400  0.000  7.400  0.000  7.400  0.000  7.400  0.999
  7439-89-6   26   Fe         4.900  0.000  4.900  0.000  4.900  0.000  4.900  0.300
  7440-50-8   29   Cu         0.029  0.000  0.029  0.000  0.029  0.000  0.029  0.010
  7440-66-6   30   Zn         0.060  0.000  0.060  0.000  0.060  0.000  0.060  0.012
  7440-38-2   33   As         0.028  0.000  0.028  0.000  0.028  0.000  0.028  0.008
  7782-49-2   34   Se         0.044  0.000  0.044  0.000  0.044  0.000  0.044  0.011
  7440-17-7   37   Rb         0.003  0.000  0.003  0.000  0.003  0.000  0.003  0.001
  7440-24-6   38   Sr         0.247  0.000  0.247  0.000  0.247  0.000  0.247  0.004
  7440-65-5   39   Y          0.003  0.000  0.003  0.000  0.003  0.000  0.003  0.002
  7440-67-7   40   Zr         0.008  0.000  0.008  0.000  0.008  0.000  0.008  0.001
 74400-30-1   41   Nb         0.002  0.000  0.002  0.000  0.002  0.000  0.002  0.001
  7439-98-7   42   Mo         0.011  0.000  0.011  0.000  0.011  0.000  0.011  0.002
  7440-36-0   51   Sb         0.002  0.000  0.002  0.000  0.002  0.000  0.002  0.001
  7439-92-1   82   Pb         0.034  0.000  0.034  0.000  0.034  0.000  0.034  0.008
----------------------------------------------------------------------------------
TOTALS:                      12.771        12.771        12.771        12.771
==================================================================================
(1)  Estimated / extrapolated.
```

```
PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Coal-Fired Power Plant
Profile Number : 11210
Data Quality   : E
--------------------------------------------------------------------------------
Control Device : ESP
Reference(s)   : 3,8
Data Source    : Samples collected isokinetically using EPA train with
                 12-minute runs. Analyzed by AAS and INAA.

SCC Assignments: 10100201

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :      0.290         0.500          0.670
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                      Total
                          0-2.5 um(1)   2.5-10 um(1)   0-10 um(1)    Measured
             Species     ------------   ------------  ------------  ------------
 CAS Number  Num  Sym     %wt    unc     %wt    unc    %wt    unc    %wt    unc
--------------------------------------------------------------------------------
  7440-23-5   11  Na     0.280  0.000   0.280  0.000   0.280  0.000   0.280  0.130
  7439-95-4   12  Mg     3.300  0.000   3.300  0.000   3.300  0.000   3.300  0.800
  7429-90-5   13  Al    19.700  0.000  19.700  0.000  19.700  0.000  19.700  6.500
  7440-09-7   19  K      1.200  0.000   1.200  0.000   1.200  0.000   1.200  0.500
  7440-70-2   20  Ca     2.600  0.000   2.600  0.000   2.600  0.000   2.600  0.600
  7440-22-2   21  Sc     0.015  0.000   0.015  0.000   0.015  0.000   0.015  0.007
  7440-32-6   22  Ti     1.800  0.000   1.800  0.000   1.800  0.000   1.800  0.700
  7440-62-2   23  V      0.062  0.000   0.062  0.000   0.062  0.000   0.062  0.021
  7440-47-3   24  Cr     0.061  0.000   0.061  0.000   0.061  0.000   0.061  0.016
  7439-96-5   25  Mn     0.074  0.000   0.074  0.000   0.074  0.000   0.074  0.064
  7439-89-6   26  Fe    11.700  0.000  11.700  0.000  11.700  0.000  11.700  7.300
  7440-48-4   27  Co     0.013  0.000   0.013  0.000   0.013  0.000   0.013  0.008
  7440-02-0   28  Ni     0.017  0.000   0.017  0.000   0.017  0.000   0.017  0.005
  7440-50-8   29  Cu     0.021  0.000   0.021  0.000   0.021  0.000   0.021  0.002
  7440-38-2   33  As     0.048  0.000   0.048  0.000   0.048  0.000   0.048  0.019
  7782-49-2   34  Se     0.031  0.000   0.031  0.000   0.031  0.000   0.031  0.014
  7440-24-6   38  Sr     0.180  0.000   0.180  0.000   0.180  0.000   0.180  0.040
  7440-74-6   49  In     0.001  0.000   0.001  0.000   0.001  0.000   0.001  0.001
  7440-36-0   51  Sb     0.007  0.000   0.007  0.000   0.007  0.000   0.007  0.005
  7440-39-3   56  Ba     0.160  0.000   0.160  0.000   0.160  0.000   0.160  0.020
  7439-91-0   57  La     0.013  0.000   0.013  0.000   0.013  0.000   0.013  0.004
  7440-45-1   58  Ce     0.035  0.000   0.035  0.000   0.035  0.000   0.035  0.006
  7440-19-9   62  Sm     0.004  0.000   0.004  0.000   0.004  0.000   0.004  0.001
  7440-53-1   63  Eu     0.001  0.000   0.001  0.000   0.001  0.000   0.001  0.000
  7429-91-6   66  Dy     0.003  0.000   0.003  0.000   0.003  0.000   0.003  0.000
  7439-92-1   82  Pb     0.011  0.000   0.011  0.000   0.011  0.000   0.011  0.002
  7440-29-1   90  Th     0.005  0.000   0.005  0.000   0.005  0.000   0.005  0.002
--------------------------------------------------------------------------------
TOTALS:                 41.342         41.342         41.342         41.342
================================================================================
{1}  Estimated / extrapolated.
```

```
PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Coal-Fired Power Plant
Profile Number : 11211
Data Quality   : E
------------------------------------------------------------------------------
Control Device : Uncontrolled
Reference(s)   : 3,9
Data Source    : Samples collected with a University of Washington Mark 10
                 impactor and an MRI Model 1502 impactor. Analyzed by INAA
                 and XRF.

SCC Assignments: 10100201

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :      0.060         0.170          0.230
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                                0-2.5 um(1)   2.5-10 um(1)   0-10 um(1)    Measured
                  Species       -----------   -----------   -----------   -----------
  CAS Number   Num   Sym        %wt    unc    %wt    unc    %wt    unc    %wt    unc
------------------------------------------------------------------------------
  7429-90-5    13    Al        9.325  0.000  9.325  0.000  9.325  0.000  9.325  1.119
  7440-09-7    19    K         0.423  0.000  0.423  0.000  0.423  0.000  0.423  0.051
  7440-70-2    20    Ca        2.883  0.000  2.883  0.000  2.883  0.000  2.883  0.346
  7440-22-2    21    Sc        0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.000
  7440-32-6    22    Ti        0.429  0.000  0.429  0.000  0.429  0.000  0.429  0.052
  7440-62-2    23    V         0.009  0.000  0.009  0.000  0.009  0.000  0.009  0.001
  7439-96-5    25    Mn        0.023  0.000  0.023  0.000  0.023  0.000  0.023  0.003
  7439-89-6    26    Fe        2.761  0.000  2.761  0.000  2.761  0.000  2.761  0.331
  7440-55-3    31    Ga        0.004  0.000  0.004  0.000  0.004  0.000  0.004  0.000
  7440-38-2    33    As        0.003  0.000  0.003  0.000  0.003  0.000  0.003  0.000
  7782-49-2    34    Se        0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.000
  7440-24-6    38    Sr        0.135  0.000  0.135  0.000  0.135  0.000  0.135  0.135
  7440-36-0    51    Sb        0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-46-2    55    Cs        0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-39-3    56    Ba        0.190  0.000  0.190  0.000  0.190  0.000  0.190  0.023
  7439-91-0    57    La        0.005  0.000  0.005  0.000  0.005  0.000  0.005  0.001
  7440-45-1    58    Ce        0.009  0.000  0.009  0.000  0.009  0.000  0.009  0.001
  7440-19-9    62    Sm        0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.000
  7440-27-9    65    Tb        0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-58-6    72    Hf        0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.000
  7440-25-7    73    Ta        0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-29-1    90    Th        0.002  0.000  0.002  0.000  0.002  0.000  0.002  0.000
------------------------------------------------------------------------------
TOTALS:                       16.205        16.205        16.205        16.205
==============================================================================
(1)  Estimated / extrapolated.
```

```
PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Coal-Fired Power Plant
Profile Number : 11212
Data Quality   : E
--------------------------------------------------------------------------------
Control Device : ESP
Reference(s)   : 3,10
Data Source    : Samples collected using ASTM sampling train; two data sets
                 consisting of three 4 to 5-hr runs per set. Analyzed by XRF,
                 GC, flameless AAS, and INAA.

SCC Assignments: 10100203

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :      0.360         0.560          0.680
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                       Total
                               0-2.5 um(1)   2.5-10 um(1)   0-10 um(1)    Measured
                 Species       ------------  ------------  ------------  ------------
 CAS Number   Num   Sym        %wt    unc    %wt    unc    %wt    unc    %wt    unc
--------------------------------------------------------------------------------
  7440-23-5   11    Na        1.129  0.000  1.129  0.000  1.129  0.000  1.129  0.068
  7429-90-5   13    Al        7.576  0.000  7.576  0.000  7.576  0.000  7.576  0.379
  7440-09-7   19    K         2.424  0.000  2.424  0.000  2.424  0.000  2.424  0.152
  7440-70-2   20    Ca        3.182  0.000  3.182  0.000  3.182  0.000  3.182  0.152
  7440-22-2   21    Sc        0.004  0.000  0.004  0.000  0.004  0.000  0.004  0.001
  7440-32-6   22    Ti        0.985  0.000  0.985  0.000  0.985  0.000  0.985  0.152
  7440-62-2   23    V         0.121  0.000  0.121  0.000  0.121  0.000  0.121  0.015
  7440-47-3   24    Cr        0.089  0.000  0.089  0.000  0.089  0.000  0.089  0.005
  7439-96-5   25    Mn        0.043  0.000  0.043  0.000  0.043  0.000  0.043  0.006
  7439-89-6   26    Fe       15.152  0.000 15.152  0.000 15.152  0.000 15.152  0.758
  7440-48-4   27    Co        0.007  0.000  0.007  0.000  0.007  0.000  0.007  0.000
  7440-66-6   30    Zn        0.591  0.000  0.591  0.000  0.591  0.000  0.591  0.045
  7440-38-2   33    As        0.044  0.000  0.044  0.000  0.044  0.000  0.044  0.003
  7782-49-2   34    Se        0.009  0.000  0.009  0.000  0.009  0.000  0.009  0.000
  7440-17-7   37    Rb        0.019  0.000  0.019  0.000  0.019  0.000  0.019  0.001
  7440-43-9   48    Cd        0.005  0.000  0.005  0.000  0.005  0.000  0.005  0.003
  7440-36-0   51    Sb        0.005  0.000  0.005  0.000  0.005  0.000  0.005  0.001
  7440-46-2   55    Cs        0.003  0.000  0.003  0.000  0.003  0.000  0.003  0.000
  7440-39-3   56    Ba        0.075  0.000  0.075  0.000  0.075  0.000  0.075  0.011
  7439-91-0   57    La        0.004  0.000  0.004  0.000  0.004  0.000  0.004  0.000
  7440-45-1   58    Ce        0.012  0.000  0.012  0.000  0.012  0.000  0.012  0.001
  7440-19-9   62    Sm        0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.000
  7440-53-1   63    Eu        0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-58-6   72    Hf        0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-25-7   73    Ta        0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7439-92-1   82    Pb        0.065  0.000  0.065  0.000  0.065  0.000  0.065  0.003
  7440-29-1   90    Th        0.003  0.000  0.003  0.000  0.003  0.000  0.003  0.000
--------------------------------------------------------------------------------
TOTALS:                      31.548        31.548        31.548        31.548
================================================================================
(1)  Estimated / extrapolated.
```

```
PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : External Combustion - Coal-Fired Composite
Profile Number : 11213
Data Quality   : E
--------------------------------------------------------------------------------
Control Device : Two bag filters, one ESP, and two uncontrolled.
Reference(s)   : 3,11
Data Source    : Composite of five coal fired plants in Japan. Samples
                 collected on on PTFE filters and analyzed using XRF and
                 INAA.

SCC Assignments: 10100201

Mass Fraction Data -  Size Interval (um) :    (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :     0.290         0.500           0.670
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                       Total
                             0-2.5 um(1)   2.5-10 um(1)   0-10 um(1)    Measured
                Species      -----------   -----------   -----------   -----------
 CAS Number  Num   Sym        %wt    unc    %wt    unc    %wt    unc    %wt    unc
--------------------------------------------------------------------------------
  7440-23-5   11   Na        0.970  0.000  0.970  0.000  0.970  0.000  0.970  0.000
  7429-90-5   13   Al        2.600  0.000  2.600  0.000  2.600  0.000  2.600  0.000
  7704-34-9   16   S         1.500  0.000  1.500  0.000  1.500  0.000  1.500  0.000
  7782-50-5   17   Cl        1.100  0.000  1.100  0.000  1.100  0.000  1.100  0.000
  7440-09-7   19   K         1.000  0.000  1.000  0.000  1.000  0.000  1.000  0.000
  7440-70-2   20   Ca        2.300  0.000  2.300  0.000  2.300  0.000  2.300  0.000
  7440-22-2   21   Sc        0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.000
  7440-32-6   22   Ti        0.260  0.000  0.260  0.000  0.260  0.000  0.260  0.000
  7440-62-2   23   V         0.013  0.000  0.013  0.000  0.013  0.000  0.013  0.000
  7440-47-3   24   Cr        0.040  0.000  0.040  0.000  0.040  0.000  0.040  0.000
  7439-96-5   25   Mn        0.031  0.000  0.031  0.000  0.031  0.000  0.031  0.000
  7439-89-6   26   Fe        1.800  0.000  1.800  0.000  1.800  0.000  1.800  0.000
  7440-48-4   27   Co        0.010  0.000  0.010  0.000  0.010  0.000  0.010  0.000
  7440-02-0   28   Ni        0.018  0.000  0.018  0.000  0.018  0.000  0.018  0.000
  7440-50-8   29   Cu        0.130  0.000  0.130  0.000  0.130  0.000  0.130  0.000
  7440-66-6   30   Zn        0.300  0.000  0.300  0.000  0.300  0.000  0.300  0.000
  7440-38-2   33   As        0.026  0.000  0.026  0.000  0.026  0.000  0.026  0.000
  7726-95-6   35   Br        0.016  0.000  0.016  0.000  0.016  0.000  0.016  0.000
  7440-17-7   37   Rb        0.005  0.000  0.005  0.000  0.005  0.000  0.005  0.000
  7440-22-4   47   Ag        0.004  0.000  0.004  0.000  0.004  0.000  0.004  0.000
  7440-36-0   51   Sb        0.008  0.000  0.008  0.000  0.008  0.000  0.008  0.000
  7440-46-2   55   Cs        0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.000
  7440-39-3   56   Ba        0.110  0.000  0.110  0.000  0.110  0.000  0.110  0.000
  7439-91-0   57   La        0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.000
  7439-92-1   82   Pb        0.200  0.000  0.200  0.000  0.200  0.200  0.000  0.000
--------------------------------------------------------------------------------
TOTALS:                     12.444        12.444        12.444        12.244
================================================================================
(1)  Estimated / extrapolated.
```

```
PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Uncontrolled Coal-fired Power Plant Composite
Profile Number : 11214
Data Quality   : E
--------------------------------------------------------------------------------
Control Device : Uncontrolled
Reference(s)   :
Data Source    : Profile represents a composite of Profiles 11202 and 11211 -
                 uncontrolled utility boiler, wet bottom design, firing
                 pulverized bituminous coal.

SCC Assignments: 10100201

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.060         0.170           0.465
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                              0-2.5 um      2.5-10 um      0-10 um      Measured
                Species     ------------  ------------  ------------  ------------
 CAS Number   Num   Sym      %wt  unc(1)   %wt  unc(1)   %wt  unc(1)   %wt  unc(1)
--------------------------------------------------------------------------------
  7429-90-5   13    Al     11.363  0.000 13.863  0.000 13.211  0.000 13.215  0.000
  7440-09-7   19    K       0.812  0.000  0.877  0.000  0.860  0.000  0.860  0.000
  7440-70-2   20    Ca      2.142  0.000  2.592  0.000  2.474  0.000  2.475  0.000
  7440-22-2   21    Sc      0.003  0.000  0.003  0.000  0.003  0.000  0.003  0.000
  7440-32-6   22    Ti      0.765  0.000  0.865  0.000  0.839  0.000  0.839  0.000
  7440-62-2   23    V       0.030  0.000  0.026  0.000  0.027  0.000  0.000  0.000
  7439-96-5   25    Mn      0.026  0.000  0.023  0.000  0.024  0.000  0.024  0.000
  7439-89-6   26    Fe      4.981  0.000  5.431  0.000  5.313  0.000  5.314  0.000
  7440-38-2   33    As      0.032  0.000  0.012  0.000  0.017  0.000  0.017  0.000
  7782-49-2   34    Se      0.013  0.000  0.002  0.000  0.005  0.000  0.005  0.000
  7440-24-6   38    Sr      0.132  0.000  0.129  0.000  0.130  0.000  0.130  0.000
  7440-46-2   55    Cs      0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.000
  7440-39-3   56    Ba      0.245  0.000  0.142  0.000  0.169  0.000  0.169  0.000
  7439-91-0   57    La      0.008  0.000  0.009  0.000  0.009  0.000  0.009  0.000
  7440-45-1   58    Ce      0.013  0.000  0.014  0.000  0.014  0.000  0.014  0.000
  7440-19-9   62    Sm      0.002  0.000  0.002  0.000  0.002  0.000  0.002  0.000
  7440-27-9   65    Tb      0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-58-6   72    Hf      0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.000
  7440-29-1   90    Th      0.002  0.000  0.003  0.000  0.003  0.000  0.003  0.000
--------------------------------------------------------------------------------
TOTALS:                    20.571        23.995        23.102        23.081
================================================================================
(1)  Uncertainty not evaluated.
```

PM Profile Speciation Report

Profile Name : Coal-fired Power Plant/ESP Composite
Profile Number : 11215
Data Quality : D

Control Device : ESP
Reference(s) :
Data Source : Profile represents a composite of Profiles 11204, 11205, 11206, 11207, 11208, 11210, and 11212.

SCC Assignments: 10100201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.290	0.500	0.670

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured	
CAS Number	Num	Sym	%wt	unc(1)	%wt	unc(1)	%wt	unc(1)	%wt	unc(1)
7440-23-5	11	Na	0.480	0.000	0.526	0.000	0.507	0.000	0.501	0.000
7439-95-4	12	Mg	1.914	0.000	2.935	0.000	2.493	0.000	2.555	0.000
7429-90-5	13	Al	10.598	0.000	13.864	0.000	12.450	0.000	12.580	0.000
7440-21-3	14	Si	15.789	0.000	26.426	0.000	21.822	0.000	22.604	0.000
7704-34-9	16	S	1.255	0.000	0.565	0.000	2.864	0.000	0.603	0.000
7440-09-7	19	K	1.421	0.000	1.665	0.000	1.559	0.000	1.558	0.000
7440-70-2	20	Ca	2.287	0.000	2.648	0.000	2.492	0.000	2.516	0.000
7440-32-6	22	Ti	0.896	0.000	1.114	0.000	1.020	0.000	1.019	0.000
7440-62-2	23	V	0.058	0.000	0.062	0.000	0.060	0.000	0.061	0.000
7440-47-3	24	Cr	0.050	0.000	0.050	0.000	0.050	0.000	0.049	0.000
7439-96-5	25	Mn	0.047	0.000	0.041	0.000	0.044	0.000	0.044	0.000
7439-89-6	26	Fe	7.239	0.000	7.730	0.000	6.089	0.000	7.534	0.000
7440-02-0	28	Ni	0.019	0.000	0.018	0.000	0.018	0.000	0.017	0.000
7440-50-8	29	Cu	0.022	0.000	0.021	0.000	0.022	0.000	0.021	0.000
7440-66-6	30	Zn	0.156	0.000	0.151	0.000	0.153	0.000	0.149	0.000
7440-38-2	33	As	0.036	0.000	0.023	0.000	0.031	0.000	0.030	0.000
7782-49-2	34	Se	0.011	0.000	0.008	0.000	0.009	0.000	0.009	0.000
7440-36-0	51	Sb	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000
7439-92-1	82	Pb	0.033	0.000	0.032	0.000	0.032	0.000	0.032	0.000
TOTALS:			42.315		57.883		51.719		51.886	

(1) Uncertainty not evaluated.

PM Profile Speciation Report

Profile Name : Coal- and Refuse Derived Fuel (RDF)-Fired Power Plant
Profile Number : 11301
Data Quality : D

Control Device : ESP
Reference(s) : 3,5
Data Source : Sampled with a SASS train. Analyzed using XRF, INAA, and FAA.

SCC Assignments: 10100201, 10101201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.290	0.500	0.670

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um(1) %wt	0-10 um(1) unc	Total Measured %wt	Total Measured unc
7440-23-5	11	Na	0.809	0.317	0.736	0.165	0.768	0.187	0.741	0.155
7429-90-5	13	Al	9.701	5.609	11.202	4.135	11.021	3.728	11.100	3.866
7440-21-3	14	Si	17.639	10.198	20.550	7.367	20.200	6.705	20.352	6.889
7704-34-9	16	S	4.687	2.129	1.480	0.527	1.866	1.030	1.706	0.512
7440-09-7	19	K	2.165	0.648	1.753	0.265	1.803	0.368	1.782	0.251
7440-70-2	20	Ca	6.570	2.148	7.971	1.166	7.802	1.320	7.875	1.095
7440-22-2	21	Sc	0.002	0.001	0.002	0.000	0.002	0.002	0.002	0.000
7440-32-6	22	Ti	0.830	0.292	0.683	0.148	0.701	0.173	0.694	0.139
7440-47-3	24	Cr	0.036	0.013	0.021	0.003	0.023	0.009	0.022	0.003
7439-96-5	25	Mn	0.122	0.045	0.088	0.019	0.092	0.028	0.090	0.018
7439-89-6	26	Fe	13.323	3.728	12.899	1.047	12.950	2.018	12.933	1.008
7440-48-4	27	Co	0.004	0.002	0.003	0.001	0.003	0.003	0.003	0.001
7440-02-0	28	Ni	0.018	0.005	0.011	0.001	0.012	0.005	0.012	0.001
7440-50-8	29	Cu	0.018	0.006	0.009	0.002	0.010	0.006	0.010	0.002
7440-66-6	30	Zn	0.496	0.134	0.201	0.018	0.236	0.072	0.222	0.019
7440-55-3	31	Ga	0.015	0.007	0.006	0.002	0.007	0.006	0.007	0.001
7440-56-4	32	Ge	0.022	0.008	0.011	0.003	0.012	0.007	0.012	0.003
7440-38-2	33	As	0.008	0.003	0.005	0.001	0.005	0.004	0.006	0.001
7782-49-2	34	Se	0.001	0.000	0.001	0.000	0.001	0.001	0.001	0.000
7726-95-6	35	Br	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001
7440-17-7	37	Rb	0.010	0.003	0.009	0.002	0.009	0.004	0.009	0.002
7440-24-6	38	Sr	0.115	0.042	0.083	0.016	0.087	0.025	0.085	0.015
7440-43-9	48	Cd	0.010	0.003	0.002	0.000	0.003	0.004	0.003	0.000
7440-31-5	50	Sn	0.008	0.002	0.003	0.001	0.004	0.003	0.004	0.001
7440-36-0	51	Sb	0.007	0.002	0.004	0.001	0.004	0.003	0.004	0.001
7440-46-2	55	Cs	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.000
7440-39-3	56	Ba	0.344	0.092	0.201	0.019	0.218	0.052	0.211	0.019
7439-91-0	57	La	0.009	0.004	0.007	0.002	0.007	0.004	0.007	0.001
7440-45-1	58	Ce	0.015	0.006	0.011	0.002	0.011	0.005	0.011	0.002
7440-19-9	62	Sm	0.002	0.001	0.001	0.000	0.001	0.002	0.001	0.000
7440-53-1	63	Eu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-27-9	65	Tb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-64-4	70	Yb	0.001	0.000	0.001	0.000	0.001	0.001	0.001	0.000
7440-58-6	72	Hf	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-25-7	73	Ta	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

PM Profile Speciation Report - continued (profile 11301)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um(1) %wt	0-10 um(1) unc	Total Measured %wt	Total Measured unc
7440-33-7	74	W	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.253	0.068	0.112	0.010	0.129	0.039	0.122	0.011
7440-29-1	90	Th	0.002	0.001	0.002	0.000	0.002	0.002	0.002	0.000
7440-61-1	92	U	0.001	0.000	0.001	0.000	0.001	0.001	0.001	0.000
TOTALS:			57.246		58.071		57.993		58.033	

(1) Calculated based on methodology in the Air Emissions Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Oil-Fired Power Plant
Profile Number : 11502
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 3,12
Data Source : Samples collected using EPA Method 5 probe and PTFE bag.
Method of elemental analysis not given.

SCC Assignments: 10100401

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.520	0.580	0.710

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um(2) %wt	0-2.5 um(2) unc	2.5-10 um(2) %wt	2.5-10 um(2) unc	0-10 um(2) %wt	0-10 um(2) unc	Total Measured %wt	Total Measured unc
7440-41-7	4	Be	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-42-8	5	B	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000
7782-41-4	9	F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-23-5	11	Na	3.906	0.000	3.906	0.000	3.906	0.000	3.906	0.200
7439-95-4	12	Mg	18.380	0.000	18.380	0.000	18.380	0.000	18.380	0.919
7429-90-5	13	Al	1.249	0.000	1.249	0.000	1.249	0.000	1.249	0.060
7440-21-3	14	Si	0.310	0.000	0.310	0.000	0.310	0.000	0.310	0.020
7723-14-0	15	P	0.008	0.000	0.008	0.000	0.008	0.000	0.008	0.001
7704-34-9	16	S	12.317	0.000	12.317	0.000	12.317	0.000	12.317	0.609
7440-09-7	19	K	0.130	0.000	0.130	0.000	0.130	0.000	0.130	0.006
7440-70-2	20	Ca	0.999	0.000	0.999	0.000	0.999	0.000	0.999	0.050
7440-22-2	21	Sc	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-32-6	22	Ti	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.005
7440-62-2	23	V	2.268	0.000	2.268	0.000	2.268	0.000	2.268	0.110
7440-47-3	24	Cr	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.001
7439-96-5	25	Mn	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002
7439-89-6	26	Fe	0.609	0.000	0.609	0.000	0.609	0.000	0.609	0.031
7440-48-4	27	Co	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.005
7440-02-0	28	Ni	1.658	0.000	1.658	0.000	1.658	0.000	1.658	0.080
7440-50-8	29	Cu	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.005
7440-66-6	30	Zn	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000
7440-55-3	31	Ga	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-38-2	33	As	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000
7782-49-2	34	Se	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7726-95-6	35	Br	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-17-7	37	Rb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-24-6	38	Sr	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.005
7440-65-5	39	Y	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.000
7440-67-7	40	Zr	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.000
74400-30-1	41	Nb	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7439-98-7	42	Mo	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.001
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-31-5	50	Sn	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	0.100	0.000	0.100	0.000	0.100	0.000	0.100	0.005

PM Profile Speciation Report - continued (profile 11502)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um(2) %wt	0-2.5 um(2) unc	2.5-10 um(2) %wt	2.5-10 um(2) unc	0-10 um(2) %wt	0-10 um(2) unc	Total Measured %wt	Total Measured unc
7439-91-0	57	La	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000
7440-45-1	58	Ce	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.000
7440-28-0	81	Tl	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7439-92-1	82	Pb	0.300	0.000	0.300	0.000	0.300	0.000	0.300	0.015
7440-29-1	90	Th	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-61-1	92	U	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
	200	TC	12.387	0.000	12.387	0.000	12.387	0.000	12.387	0.619
	203	SO4	36.861	0.000	36.861	0.000	36.861	0.000	36.861	1.838
	204	NO3	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.000
TOTALS:			91.764		91.764		91.764		91.764	

(1) No control specified; thus, assumed uncontrolled.

(2) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Oil-Fired Power Plant
Profile Number : 11503
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 3,12
Data Source : Samples collected using EPA Method 5 probe and PTFE bag.
Method of elemental analysis not given.

SCC Assignments: 10100401

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.520	0.580	0.710

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um(2) %wt	0-2.5 um(2) unc	2.5-10 um(2) %wt	2.5-10 um(2) unc	0-10 um(2) %wt	0-10 um(2) unc	Total Measured %wt	Total Measured unc
7440-41-7	4	Be	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-42-8	5	B	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-23-5	11	Na	0.299	0.000	0.299	0.000	0.299	0.000	0.299	0.015
7439-95-4	12	Mg	3.403	0.000	3.403	0.000	3.403	0.000	3.403	0.170
7429-90-5	13	Al	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.005
7440-21-3	14	Si	0.200	0.000	0.200	0.000	0.200	0.000	0.200	0.010
7723-14-0	15	P	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7704-34-9	16	S	4.000	0.000	4.000	0.000	4.000	0.000	4.000	0.200
7440-09-7	19	K	0.100	0.000	0.100	0.000	0.100	0.000	0.100	0.005
7440-70-2	20	Ca	0.309	0.000	0.309	0.000	0.309	0.000	0.309	0.016
7440-32-6	22	Ti	0.030	0.000	0.030	0.000	0.030	0.000	0.030	0.003
7440-62-2	23	V	6.667	0.000	6.667	0.000	6.667	0.000	6.667	0.333
7440-47-3	24	Cr	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.005
7439-96-5	25	Mn	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002
7439-89-6	26	Fe	0.399	0.000	0.399	0.000	0.399	0.000	0.399	0.020
7440-48-4	27	Co	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.000
7440-02-0	28	Ni	0.848	0.000	0.848	0.000	0.848	0.000	0.848	0.043
7440-50-8	29	Cu	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.001
7440-66-6	30	Zn	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000
7440-55-3	31	Ga	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-38-2	33	As	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7782-49-2	34	Se	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7726-95-6	35	Br	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-17-7	37	Rb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-24-6	38	Sr	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.001
7440-65-5	39	Y	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-67-7	40	Zr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
74400-30-1	41	Nb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-98-7	42	Mo	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.000
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-31-5	50	Sn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002
7439-91-0	57	La	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-45-1	58	Ce	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

PM Profile Speciation Report - continued (profile 11503)

Total Particulate Matter -

	Species		0-2.5 um(2)		2.5-10 um(2)		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7439-92-1	82	Pb	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002
7440-29-1	90	Th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-61-1	92	U	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	200	TC	68.862	0.000	68.862	0.000	68.862	0.000	68.862	3.443
	203	SO4	11.976	0.000	11.976	0.000	11.976	0.000	11.976	0.599
	204	NO3	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.001
TOTALS:			97.305		97.305		97.305		97.305	

(1) No control specified; thus, assumed uncontrolled.

(2) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Oil-Fired Power Plant
Profile Number : 11504
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 3,12
Data Source : Samples collected using EPA Method 5 probe and PTFE bag.
Method of elemental analysis not given.

SCC Assignments: 10100401

Mass Fraction Data -				
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.520	0.580	0.710

Total Particulate Matter -

	Species		0-2.5 um(2)		2.5-10 um(2)		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-41-7	4	Be	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-42-8	5	B	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7782-41-4	9	F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-23-5	11	Na	0.500	0.000	0.500	0.000	0.500	0.000	0.500	0.025
7439-95-4	12	Mg	5.942	0.000	5.942	0.000	5.942	0.000	5.942	0.297
7429-90-5	13	Al	0.400	0.000	0.400	0.000	0.400	0.000	0.400	0.020
7440-21-3	14	Si	0.200	0.000	0.200	0.000	0.200	0.000	0.200	0.010
7723-14-0	15	P	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000
7704-34-9	16	S	13.766	0.000	13.766	0.000	13.766	0.000	13.766	0.688
7440-09-7	19	K	0.100	0.000	0.100	0.000	0.100	0.000	0.100	0.005
7440-70-2	20	Ca	0.100	0.000	0.100	0.000	0.100	0.000	0.100	0.005
7440-22-2	21	Sc	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-32-6	22	Ti	0.040	0.000	0.040	0.000	0.040	0.000	0.040	0.004
7440-62-2	23	V	10.204	0.000	10.204	0.000	10.204	0.000	10.204	0.510
7440-47-3	24	Cr	0.100	0.000	0.100	0.000	0.100	0.000	0.100	0.005
7439-96-5	25	Mn	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002
7439-89-6	26	Fe	0.410	0.000	0.410	0.000	0.410	0.000	0.410	0.021
7440-48-4	27	Co	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002
7440-02-0	28	Ni	1.291	0.000	1.291	0.000	1.291	0.000	1.291	0.065
7440-50-8	29	Cu	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002
7440-66-6	30	Zn	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002
7440-55-3	31	Ga	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.001
7440-38-2	33	As	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000
7782-49-2	34	Se	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7726-95-6	35	Br	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000
7440-17-7	37	Rb	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-24-6	38	Sr	0.030	0.000	0.030	0.000	0.030	0.000	0.030	0.003
7440-65-5	39	Y	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-67-7	40	Zr	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
74400-30-1	41	Nb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-98-7	42	Mo	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.001
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-31-5	50	Sn	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-36-0	51	Sb	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-39-3	56	Ba	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002

PM Profile Speciation Report - continued (profile 11504)

Total Particulate Matter -

	Species		0-2.5 um(2)		2.5-10 um(2)		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7439-91-0	57	La	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.001
7440-45-1	58	Ce	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000
7440-33-7	74	W	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-28-0	81	Tl	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	0.040	0.000	0.040	0.000	0.040	0.000	0.040	0.004
7440-29-1	90	Th	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-61-1	92	U	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	200	TC	21.509	0.000	21.509	0.000	21.509	0.000	21.509	1.080
	203	SO4	41.216	0.000	41.216	0.000	41.216	0.000	41.216	2.061
	204	NO3	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002
TOTALS:			96.011		96.011		96.011		96.011	

(1) No control specified; thus, assumed uncontrolled.

(2) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Oil-Fired Power Plant
Profile Number : 11505
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 3,12
Data Source : Samples collected using EPA Method 5 probe and PTFE bag.
Method of elemental analysis not given.

SCC Assignments: 10100401

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.520	0.580	0.710

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um(2) %wt	0-2.5 um(2) unc	2.5-10 um(2) %wt	2.5-10 um(2) unc	0-10 um(2) %wt	0-10 um(2) unc	Total Measured %wt	Total Measured unc
7440-41-7	4	Be	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-42-8	5	B	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7782-41-4	9	F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-23-5	11	Na	1.995	0.000	1.995	0.000	1.995	0.000	1.995	0.100
7439-95-4	12	Mg	2.494	0.000	2.494	0.000	2.494	0.000	2.494	0.130
7429-90-5	13	Al	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.001
7440-21-3	14	Si	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.005
7723-14-0	15	P	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7704-34-9	16	S	19.196	0.000	19.196	0.000	19.196	0.000	19.196	0.960
7440-09-7	19	K	0.100	0.000	0.100	0.000	0.100	0.000	0.100	0.005
7440-70-2	20	Ca	0.200	0.000	0.200	0.000	0.200	0.000	0.200	0.010
7440-22-2	21	Sc	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-32-6	22	Ti	0.040	0.000	0.040	0.000	0.040	0.000	0.040	0.004
7440-62-2	23	V	12.821	0.000	12.821	0.000	12.821	0.000	12.821	0.639
7440-47-3	24	Cr	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.005
7439-96-5	25	Mn	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.005
7439-89-6	26	Fe	0.479	0.000	0.479	0.000	0.479	0.000	0.479	0.024
7440-48-4	27	Co	0.030	0.000	0.030	0.000	0.030	0.000	0.030	0.003
7440-02-0	28	Ni	2.275	0.000	2.275	0.000	2.275	0.000	2.275	0.110
7440-50-8	29	Cu	0.040	0.000	0.040	0.000	0.040	0.000	0.040	0.004
7440-66-6	30	Zn	0.040	0.000	0.040	0.000	0.040	0.000	0.040	0.004
7440-55-3	31	Ga	0.006	0.000	0.006	0.000	0.006	0.000	0.006	0.001
7440-38-2	33	As	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000
7782-49-2	34	Se	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7726-95-6	35	Br	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7440-17-7	37	Rb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-24-6	38	Sr	0.030	0.000	0.030	0.000	0.030	0.000	0.030	0.003
7440-65-5	39	Y	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-67-7	40	Zr	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
74400-30-1	41	Nb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-98-7	42	Mo	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.001
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-31-5	50	Sn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-36-0	51	Sb	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-46-2	55	Cs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

PM Profile Speciation Report - continued (profile 11505)

Total Particulate Matter -

	Species		0-2.5 um(2)		2.5-10 um(2)		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-39-3	56	Ba	0.100	0.000	0.100	0.000	0.100	0.000	0.100	0.005
7439-91-0	57	La	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.000
7440-45-1	58	Ce	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000
7440-33-7	74	W	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-28-0	81	Tl	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	0.040	0.000	0.040	0.000	0.040	0.000	0.040	0.004
7440-29-1	90	Th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-61-1	92	U	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
	200	TC	1.497	0.000	1.497	0.000	1.497	0.000	1.497	0.075
	203	SO4	57.468	0.000	57.468	0.000	57.468	0.000	57.468	2.873
	204	NO3	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002
TOTALS:			99.060		99.060		99.060		99.060	

(1) No control specified; thus, assumed uncontrolled.

(2) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Oil-Fired Power Plant
Profile Number : 11506
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 3,12
Data Source : Samples collected using EPA Method 5 probe and PTFE bag.
Method of elemental analysis not given.

SCC Assignments: 10100401

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.520	0.580	0.710

Total Particulate Matter -

	Species		0-2.5 um(2)		2.5-10 um(2)		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-41-7	4	Be	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-42-8	5	B	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-23-5	11	Na	0.200	0.000	0.200	0.000	0.200	0.000	0.200	0.001
7439-95-4	12	Mg	2.400	0.000	2.400	0.000	2.400	0.000	2.400	0.120
7429-90-5	13	Al	1.420	0.000	1.420	0.000	1.420	0.000	1.420	0.071
7440-21-3	14	Si	0.220	0.000	0.220	0.000	0.220	0.000	0.220	0.011
7723-14-0	15	P	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.005
7704-34-9	16	S	16.432	0.000	16.432	0.000	16.432	0.000	16.432	0.822
7440-09-7	19	K	0.120	0.000	0.120	0.000	0.120	0.000	0.120	0.006
7440-70-2	20	Ca	0.320	0.000	0.320	0.000	0.320	0.000	0.320	0.016
7440-32-6	22	Ti	0.070	0.000	0.070	0.000	0.070	0.000	0.070	0.007
7440-62-2	23	V	1.100	0.000	1.100	0.000	1.100	0.000	1.100	0.055
7440-47-3	24	Cr	0.045	0.000	0.045	0.000	0.045	0.000	0.045	0.005
7439-96-5	25	Mn	0.030	0.000	0.030	0.000	0.030	0.000	0.030	0.003
7439-89-6	26	Fe	0.400	0.000	0.400	0.000	0.400	0.000	0.400	0.020
7440-48-4	27	Co	0.030	0.000	0.030	0.000	0.030	0.000	0.030	0.003
7440-02-0	28	Ni	0.350	0.000	0.350	0.000	0.350	0.000	0.350	0.018
7440-50-8	29	Cu	0.040	0.000	0.040	0.000	0.040	0.000	0.040	0.004
7440-66-6	30	Zn	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002
7440-55-3	31	Ga	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.000
7440-38-2	33	As	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7782-49-2	34	Se	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7726-95-6	35	Br	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-17-7	37	Rb	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-24-6	38	Sr	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.002
7440-65-5	39	Y	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-67-7	40	Zr	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
74400-30-1	41	Nb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-98-7	42	Mo	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.002
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-31-5	50	Sn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-36-0	51	Sb	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.002
7440-46-2	55	Cs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	0.100	0.000	0.100	0.000	0.100	0.000	0.100	0.005
7439-91-0	57	La	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.002

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PM Profile Speciation Report  -  continued (profile 11506)
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                       Total
                             0-2.5 um(2)   2.5-10 um(2)   0-10 um(2)    Measured
              Species       ------------   ------------  ------------  ------------
 CAS Number  Num   Sym       %wt    unc     %wt    unc    %wt    unc    %wt    unc
------------------------------------------------------------------------------
  7440-45-1   58   Ce       0.010  0.000   0.010  0.000  0.010  0.000  0.010  0.005
  7440-33-7   74   W        0.000  0.000   0.000  0.000  0.000  0.000  0.000  0.000
  7440-28-0   81   Tl       0.000  0.000   0.000  0.000  0.000  0.000  0.000  0.000
  7439-92-1   82   Pb       0.030  0.000   0.030  0.000  0.030  0.000  0.030  0.003
  7440-29-1   90   Th       0.000  0.000   0.000  0.000  0.000  0.000  0.000  0.000
  7440-61-1   92   U        0.000  0.000   0.000  0.000  0.000  0.000  0.000  0.000
             200   TC      14.501  0.000  14.501  0.000 14.501  0.000 14.501  0.730
             203   SO4     49.205  0.000  49.205  0.000 49.205  0.000 49.205  2.460
------------------------------------------------------------------------------
TOTALS:                    87.168         87.168        87.168        87.168
==============================================================================
(1)  No control specified; thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
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PM Profile Speciation Report

Profile Name : Oil-Fired Power Plant
Profile Number : 11507
Data Quality : C

Control Device : Uncontrolled(1)
Reference(s) : 1
Data Source : Twenty five samples from four boilers collected over a 6-day period.

SCC Assignments: 10100401

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.520	0.580	0.710

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(2)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.097	0.139	1.063	0.594	0.155	0.528	0.155	0.000
7440-21-3	14	Si	0.263	0.152	1.448	0.467	0.334	0.435	0.334	0.000
7723-14-0	15	P	0.026	0.032	0.087	0.091	0.029	0.083	0.029	0.000
7704-34-9	16	S	11.858	1.071	10.758	3.227	11.792	3.227	11.792	0.000
7782-50-5	17	Cl	0.144	0.122	1.056	0.629	0.199	0.555	0.199	0.000
7440-09-7	19	K	0.149	0.068	0.165	0.127	0.150	0.124	0.150	0.000
7440-70-2	20	Ca	0.609	0.172	0.978	0.268	0.631	0.285	0.631	0.000
7440-32-6	22	Ti	0.045	0.016	0.128	0.065	0.050	0.062	0.050	0.000
7440-62-2	23	V	0.519	0.146	0.381	0.105	0.511	0.157	0.511	0.000
7440-47-3	24	Cr	0.050	0.024	0.164	0.061	0.057	0.062	0.057	0.000
7439-96-5	25	Mn	0.017	0.007	0.107	0.063	0.023	0.059	0.023	0.000
7439-89-6	26	Fe	1.267	0.675	1.254	0.600	1.266	0.734	1.266	0.000
7440-02-0	28	Ni	1.115	0.425	0.728	0.111	1.092	0.353	1.092	0.000
7440-50-8	29	Cu	0.007	0.007	0.021	0.034	0.008	0.031	0.008	0.000
7440-66-6	30	Zn	0.100	0.030	0.050	0.039	0.097	0.044	0.097	0.000
7440-55-3	31	Ga	0.005	0.004	0.007	0.011	0.005	0.011	0.005	0.000
7440-38-2	33	As	0.025	0.008	0.019	0.029	0.025	0.027	0.025	0.000
7782-49-2	34	Se	0.002	0.002	0.034	0.031	0.004	0.029	0.004	0.000
7726-95-6	35	Br	0.001	0.002	0.053	0.058	0.004	0.052	0.004	0.000
7440-17-7	37	Rb	0.000	0.003	0.028	0.050	0.002	0.044	0.002	0.000
7440-24-6	38	Sr	0.001	0.002	0.021	0.041	0.002	0.036	0.002	0.000
7440-65-5	39	Y	0.000	0.005	0.029	0.057	0.002	0.050	0.002	0.000
7440-67-7	40	Zr	0.006	0.013	0.006	0.021	0.006	0.021	0.006	0.000
7439-98-7	42	Mo	0.000	0.001	0.000	0.180	0.000	0.154	0.000	0.000
7440-05-3	46	Pd	0.001	0.005	0.096	0.145	0.007	0.125	0.007	0.000
7440-22-4	47	Ag	0.005	0.007	0.218	0.247	0.018	0.214	0.018	0.000
7440-43-9	48	Cd	0.002	0.003	0.227	0.193	0.015	0.169	0.015	0.000
7440-74-6	49	In	0.003	0.005	0.293	0.263	0.020	0.228	0.020	0.000
7440-31-5	50	Sn	0.000	0.001	0.218	0.326	0.013	0.281	0.013	0.000
7440-36-0	51	Sb	0.002	0.007	0.598	0.770	0.038	0.662	0.038	0.000
7440-39-3	56	Ba	0.000	0.134	0.996	1.449	0.060	1.247	0.060	0.000
7439-91-0	57	La	0.000	0.244	1.728	2.660	0.104	2.288	0.104	0.000
7439-97-6	80	Hg	0.000	0.000	0.019	0.018	0.001	0.017	0.001	0.000
7439-92-1	82	Pb	0.032	0.014	0.136	0.164	0.038	0.143	0.038	0.000
	201	OC	5.000	2.500	44.000	16.500	7.300	14.614	7.300	0.000

```
PM Profile Speciation Report  -  continued (profile 11507)
-------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                             0-2.5 um      2.5-10 um       0-10 um     Measured(2)
            Species        ------------   ------------   ------------  ------------
 CAS Number  Num   Sym       %wt    unc     %wt    unc     %wt    unc    %wt    unc
-------------------------------------------------------------------------------
             202   EC      12.800  9.300  18.700 15.000  13.200 14.659  13.200  0.000
-------------------------------------------------------------------------------
TOTALS:                    34.151         85.814         37.258         37.258
===============================================================================
(1)  No control specified: thus, assumed uncontrolled.
(2)  Estamated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Oil-Fired Power Plant
Profile Number : 11508
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1
Data Source : Unspecified methodology.

SCC Assignments: 10100401

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.520	0.580	0.710

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(2)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	2.600	0.600	2.500	1.100	2.594	1.093	2.594	0.000
7429-90-5	13	Al	0.420	0.080	3.700	0.300	0.602	0.398	0.602	0.000
7440-21-3	14	Si	1.900	0.600	8.200	1.500	2.250	1.507	2.250	0.000
7723-14-0	15	P	1.500	0.400	2.300	0.200	1.544	0.420	1.544	0.000
7704-34-9	16	S	11.000	2.000	9.000	1.000	10.889	2.155	10.889	0.000
7782-50-5	17	Cl	0.018	0.008	0.160	0.090	0.026	0.082	0.026	0.000
7440-09-7	19	K	0.160	0.050	0.350	0.050	0.171	0.074	0.171	0.000
7440-70-2	20	Ca	3.400	0.900	7.600	3.800	3.633	3.387	3.633	0.000
7440-32-6	22	Ti	0.050	0.050	0.690	0.140	0.086	0.145	0.086	0.000
7440-62-2	23	V	1.100	0.300	1.500	0.800	1.122	0.740	1.122	0.000
7440-47-3	24	Cr	0.022	0.001	0.065	0.016	0.024	0.022	0.024	0.000
7439-96-5	25	Mn	0.035	0.004	0.057	0.018	0.036	0.022	0.036	0.000
7439-89-6	26	Fe	1.500	0.200	2.900	0.400	1.578	0.468	1.578	0.000
7440-48-4	27	Co	0.075	0.014	0.100	0.020	0.076	0.030	0.076	0.000
7440-02-0	28	Ni	1.500	0.500	2.100	0.200	1.533	0.468	1.533	0.000
7440-50-8	29	Cu	0.098	0.032	0.140	0.020	0.100	0.040	0.100	0.000
7440-66-6	30	Zn	1.200	0.300	1.600	0.500	1.222	0.516	1.222	0.000
7440-38-2	33	As	0.003	0.001	0.004	0.003	0.003	0.005	0.003	0.000
7782-49-2	34	Se	0.002	0.001	0.003	0.001	0.002	0.003	0.002	0.000
7726-95-6	35	Br	0.011	0.006	0.002	0.001	0.011	0.006	0.011	0.000
7440-24-6	38	Sr	0.016	0.005	0.100	0.013	0.021	0.024	0.021	0.000
7440-67-7	40	Zr	0.021	0.021	0.200	0.110	0.031	0.100	0.031	0.000
7439-98-7	42	Mo	0.087	0.018	0.077	0.022	0.086	0.031	0.086	0.000
7440-31-5	50	Sn	0.034	0.022	NR	0.000	0.032	0.016	0.032	0.000
7440-36-0	51	Sb	0.035	0.038	0.012	0.013	0.034	0.031	0.034	0.000
7440-39-3	56	Ba	0.186	0.009	0.550	0.260	0.206	0.232	0.206	0.000
7439-91-0	57	La	0.012	0.002	0.170	0.020	0.021	0.033	0.021	0.000
7440-45-1	58	Ce	0.008	0.002	0.058	0.007	0.011	0.017	0.011	0.000
7440-00-8	60	Nd	0.003	0.000	0.050	0.021	0.005	0.023	0.005	0.000
7440-19-9	62	Sm	0.000	0.000	0.004	0.001	0.001	0.004	0.001	0.000
7439-92-1	82	Pb	1.800	0.600	3.000	0.400	1.867	0.636	1.867	0.000
	201	OC	3.200	0.500	12.000	8.000	3.689	6.924	3.689	0.000
	202	EC	7.700	1.500	21.000	1.000	8.439	2.241	8.439	0.000
	203	SO4	40.000	3.000	47.000	4.000	40.389	6.763	40.389	0.000
TOTALS:			79.696		127.192		82.334		82.334	

(1) No control specified: thus, assumed uncontrolled.
(2) Estamated / extrapolated.

```
PM Profile Speciation Report
-----------------------------------------------------------------------------
Profile Name   : Oil-Fired Power Plant
Profile Number : 11509
Data Quality   : D
-----------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1
Data Source    : Unspecified methodology.

SCC Assignments: 10100401

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :      0.520         0.580          0.710
-----------------------------------------------------------------------------
Total Particulate Matter -
                                                                       Total
                              0-2.5 um     2.5-10 um     0-10 um     Measured(2)
                 Species    -----------   -----------  -----------   -----------
 CAS Number    Num   Sym     %wt    unc    %wt    unc    %wt    unc    %wt    unc
-----------------------------------------------------------------------------
  7440-23-5    11    Na     3.100 0.900  4.400 4.300  3.152 3.768  3.152 0.000
  7429-90-5    13    Al     0.890 0.070  9.700 1.400  1.242 1.410  1.242 0.000
  7440-21-3    14    Si     2.600 0.400 22.000 6.000  3.376 5.404  3.376 0.000
  7723-14-0    15    P      1.000 0.100  1.700 0.600  1.028 0.549  1.028 0.000
  7704-34-9    16    S     13.000 1.000  9.200 4.000 12.848 3.815 12.848 0.000
  7782-50-5    17    Cl        NR 0.000  0.430 0.260  0.017 0.228  0.017 0.000
  7440-09-7    19    K      0.210 0.030  0.340 0.110  0.215 0.108  0.215 0.000
  7440-70-2    20    Ca     2.100 0.900 16.000 2.000  2.656 2.201  2.656 0.000
  7440-22-2    21    Sc        NR 0.000  0.001 0.000  0.000 0.001  0.000 0.000
  7440-32-6    22    Ti     0.120 0.020  1.000 0.200  0.155 0.197  0.155 0.000
  7440-62-2    23    V      1.900 0.300  1.000 1.800  1.864 1.571  1.864 0.000
  7440-47-3    24    Cr     0.022 0.007  0.041 0.013  0.023 0.018  0.023 0.000
  7439-96-5    25    Mn     0.023 0.008  0.062 0.017  0.025 0.023  0.025 0.000
  7439-89-6    26    Fe     1.600 0.400  3.200 0.500  1.664 0.603  1.664 0.000
  7440-48-4    27    Co     0.110 0.010  0.120 0.030  0.110 0.037  0.110 0.000
  7440-02-0    28    Ni     1.900 0.200  1.800 0.500  1.896 0.517  1.896 0.000
  7440-50-8    29    Cu     0.110 0.050  0.800 0.800  0.138 0.690  0.138 0.000
  7440-66-6    30    Zn     0.730 0.290  0.840 0.110  0.734 0.258  0.734 0.000
  7440-38-2    33    As     0.005 0.001  0.008 0.007  0.006 0.008  0.006 0.000
  7782-49-2    34    Se     0.002 0.001  0.001 0.001  0.002 0.002  0.002 0.000
  7726-95-6    35    Br     0.004 0.000  0.007 0.004  0.005 0.006  0.005 0.000
  7440-24-6    38    Sr     0.028 0.007  0.150 0.040  0.033 0.044  0.033 0.000
  7440-67-7    40    Zr     0.016 0.013  0.190 0.050  0.023 0.053  0.023 0.000
  7439-98-7    42    Mo     0.160 0.020  0.240 0.160  0.163 0.143  0.163 0.000
  7440-22-4    47    Ag        NR 0.000  0.010 0.004  0.000 0.007  0.000 0.000
  7440-31-5    50    Sn     0.021 0.008  0.330 0.310  0.033 0.269  0.033 0.000
  7440-36-0    51    Sb     0.097 0.008  0.064 0.034  0.096 0.035  0.096 0.000
  7440-39-3    56    Ba     0.130 0.005  0.940 0.060  0.162 0.106  0.162 0.000
  7439-91-0    57    La     0.042 0.003  0.590 0.140  0.064 0.136  0.064 0.000
  7440-45-1    58    Ce     0.034 0.002  0.350 0.020  0.047 0.048  0.047 0.000
  7440-00-8    60    Nd     0.022 0.002  0.270 0.030  0.032 0.046  0.032 0.000
  7440-19-9    62    Sm     0.002 0.000  0.028 0.007  0.003 0.012  0.003 0.000
  7440-53-1    63    Eu        NR 0.000  0.001 0.000  0.000 0.002  0.000 0.000
  7440-27-9    65    Tb        NR 0.000  0.001 0.000  0.000 0.002  0.000 0.000
  7439-92-1    82    Pb     1.000 0.200  0.650 0.340  0.986 0.349  0.986 0.000
  7440-29-1    90    Th        NR 0.000  0.002 0.000  0.000 0.003  0.000 0.000
-----------------------------------------------------------------------------
```

```
PM Profile Speciation Report  -  continued (profile 11509)
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                    Total
                               0-2.5 um      2.5-10 um      0-10 um      Measured(2)
                  Species    ------------  ------------  ------------  ------------
CAS Number   Num   Sym         %wt    unc    %wt    unc    %wt    unc    %wt    unc
------------------------------------------------------------------------------
             201   OC        1.000  0.500 26.000 16.000  2.000 13.833  2.000  0.000
             202   EC        0.220  0.170  1.100  1.100  0.255  0.955  0.255  0.000
             203   SO4      45.000  7.000 40.000 30.000 44.800 26.756 44.800  0.000
------------------------------------------------------------------------------
TOTALS:                     77.198        143.566        79.853        79.853
==============================================================================
(1)  No control specified: thus, assumed uncontrolled.
(2)  Estamated / extrapolated.
```

```
PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Oil-fired Power Plant Composite
Profile Number : 11510
Data Quality   : E
--------------------------------------------------------------------------------
Control Device : Uncontrolled
Reference(s)   :
Data Source    : Profile represents a composite of Profiles 11502, 11503,
                 11504, 11505, 11506, 11507, 11508, and 11509.

SCC Assignments: 10100401

Mass Fraction Data -  Size Interval (um) :     (0-2.5)         (0-6)          (0-10)
                      Mass Fraction      :      0.520          0.580           0.710
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                         Total
                               0-2.5 um       2.5-10 um      0-10 um     Measured
                Species      ------------   ------------  ------------  ------------
 CAS Number   Num   Sym       %wt  unc(1)    %wt  unc(1)   %wt  unc(1)   %wt  unc(1)
--------------------------------------------------------------------------------
  7429-90-5    13   Al       0.567  0.000   2.199  0.000   0.641  0.000   0.641  0.000
  7440-21-3    14   Si       0.718  0.000   4.079  0.000   0.868  0.000   0.868  0.000
  7723-14-0    15   P        0.324  0.000   0.519  0.000   0.333  0.000   0.333  0.000
  7704-34-9    16   S       12.696  0.000  11.834  0.000  12.655  0.000  12.655  0.000
  7440-09-7    19   K        0.134  0.000   0.176  0.000   0.136  0.000   0.136  0.000
  7440-70-2    20   Ca       1.005  0.000   3.313  0.000   1.106  0.000   1.106  0.000
  7440-32-6    22   Ti       0.056  0.000   0.256  0.000   0.065  0.000   0.065  0.000
  7440-62-2    23   V        4.572  0.000   4.493  0.000   4.570  0.000   4.570  0.000
  7440-47-3    24   Cr       0.044  0.000   0.066  0.000   0.045  0.000   0.045  0.000
  7439-96-5    25   Mn       0.027  0.000   0.046  0.000   0.028  0.000   0.028  0.000
  7439-89-6    26   Fe       0.833  0.000   1.206  0.000   0.851  0.000   0.851  0.000
  7440-02-0    28   Ni       1.367  0.000   1.381  0.000   1.368  0.000   1.368  0.000
  7440-50-8    29   Cu       0.047  0.000   0.140  0.000   0.051  0.000   0.051  0.000
  7440-66-6    30   Zn       0.265  0.000   0.322  0.000   0.268  0.000   0.268  0.000
  7440-38-2    33   As       0.006  0.000   0.006  0.000   0.006  0.000   0.006  0.000
  7782-49-2    34   Se       0.001  0.000   0.005  0.000   0.001  0.000   0.001  0.000
  7726-95-6    35   Br       0.003  0.000   0.009  0.000   0.003  0.000   0.003  0.000
  7440-24-6    38   Sr       0.023  0.000   0.051  0.000   0.025  0.000   0.025  0.000
  7440-67-7    40   Zr       0.007  0.000   0.051  0.000   0.009  0.000   0.009  0.000
  7439-98-7    42   Mo       0.037  0.000   0.046  0.000   0.037  0.000   0.037  0.000
  7440-31-5    50   Sn       0.007  0.000   0.079  0.000   0.010  0.000   0.010  0.000
  7440-36-0    51   Sb       0.019  0.000   0.086  0.000   0.023  0.000   0.023  0.000
  7440-39-3    56   Ba       0.082  0.000   0.353  0.000   0.096  0.000   0.096  0.000
  7439-91-0    57   La       0.011  0.000   0.315  0.000   0.027  0.000   0.027  0.000
  7439-92-1    82   Pb       0.408  0.000   0.527  0.000   0.415  0.000   0.415  0.000
--------------------------------------------------------------------------------
TOTALS:                     23.259         31.558         23.637         23.637
================================================================================
(1)  Uncertainty not evaluated.
```

PM Profile Speciation Report

Profile Name : External Combustion - Kerosene-Fired Boiler Composite
Profile Number : 12301
Data Quality : E

Control Device : Uncontrolled
Reference(s) : 3,11
Data Source : Composite of three kerosene-fired boilers in Japan. Samples collected on PTFE filters and analyzed using XRF and INAA.

SCC Assignments: 10200500

Mass Fraction Data -		(0-2.5)(1)	(0-6)(1)	(0-10)(1)
	Size Interval (um) :	(0-2.5)(1)	(0-6)(1)	(0-10)(1)
	Mass Fraction :	0.120	0.300	0.500

Total Particulate Matter -

	Species		0-2.5 um(2)		2.5-10 um(2)		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.380	0.000	0.380	0.000	0.380	0.000	0.380	0.000
7439-95-4	12	Mg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7429-90-5	13	Al	0.600	0.000	0.600	0.000	0.600	0.000	0.600	0.000
7704-34-9	16	S	1.400	0.000	1.400	0.000	1.400	0.000	1.400	0.000
7782-50-5	17	Cl	0.260	0.000	0.260	0.000	0.260	0.000	0.260	0.000
7440-09-7	19	K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-70-2	20	Ca	0.360	0.000	0.360	0.000	0.360	0.000	0.360	0.000
7440-22-2	21	Sc	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-32-6	22	Ti	0.045	0.000	0.045	0.000	0.045	0.000	0.045	0.000
7440-62-2	23	V	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.000
7440-47-3	24	Cr	0.024	0.000	0.024	0.000	0.024	0.000	0.024	0.000
7439-96-5	25	Mn	0.026	0.000	0.026	0.000	0.026	0.000	0.026	0.000
7439-89-6	26	Fe	1.500	0.000	1.500	0.000	1.500	0.000	1.500	0.000
7440-48-4	27	Co	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7440-02-0	28	Ni	0.120	0.000	0.120	0.000	0.120	0.000	0.120	0.000
7440-50-8	29	Cu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-66-6	30	Zn	0.140	0.000	0.140	0.000	0.140	0.000	0.140	0.000
7440-38-2	33	As	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000
7726-95-6	35	Br	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.000
7440-17-7	37	Rb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-22-4	47	Ag	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-36-0	51	Sb	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7440-46-2	55	Cs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	4.700	0.000	4.700	0.000	4.700	0.000	4.700	0.000
7439-91-0	57	La	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTALS:			9.582		9.582		9.582		9.582	

(1) Mass fraction data for uncontrolled distillate oil firing.
(2) Estimated / extrapolated.

```
PM Profile Speciation Report
------------------------------------------------------------------------------------
Profile Name   : External Combustion - Wood-Fired Boiler Composite
Profile Number : 12705
Data Quality   : E
------------------------------------------------------------------------------------
Control Device : Three multicyclone and bag filter, one multicyclon
Reference(s)   : 3,11
Data Source    : Six wood-fired boilers in Japan. Samples collected on PTFE
                 filters and analyzed using XRF and INAA.

SCC Assignments: 10200903

Mass Fraction Data -  Size Interval (um) :     (0-2.5)         (0-6)           (0-10)
                      Mass Fraction      :      0.540          0.800            0.910
------------------------------------------------------------------------------------
Total Particulate Matter -
                                                                         Total
                                 0-2.5 um(1)   2.5-10 um(1)   0-10 um(1)    Measured
                  Species        ------------  ------------  ------------  ------------
 CAS Number  Num  Sym            %wt    unc    %wt    unc    %wt    unc    %wt    unc
------------------------------------------------------------------------------------
  7440-23-5   11  Na          15.000  0.000 15.000  0.000 15.000  0.000 15.000  0.000
  7439-95-4   12  Mg           0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7429-90-5   13  Al           0.100  0.000  0.100  0.000  0.100  0.000  0.100  0.000
  7704-34-9   16  S            0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7782-50-5   17  Cl          23.000  0.000 23.000  0.000 23.000  0.000 23.000  0.000
  7440-09-7   19  K            5.200  0.000  5.200  0.000  5.200  0.000  5.200  0.000
  7440-70-2   20  Ca           4.000  0.000  4.000  0.000  4.000  0.000  4.000  0.000
  7440-22-2   21  Sc           0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-32-6   22  Ti           0.010  0.000  0.010  0.000  0.010  0.000  0.010  0.000
  7440-62-2   23  V            0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-47-3   24  Cr           0.004  0.000  0.004  0.000  0.004  0.000  0.004  0.000
  7439-96-5   25  Mn           0.100  0.000  0.100  0.000  0.100  0.000  0.100  0.000
  7439-89-6   26  Fe           0.230  0.000  0.230  0.000  0.230  0.000  0.230  0.000
  7440-48-4   27  Co           0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-02-0   28  Ni           0.027  0.000  0.027  0.000  0.027  0.000  0.027  0.000
  7440-50-8   29  Cu           0.024  0.000  0.024  0.000  0.024  0.000  0.024  0.000
  7440-66-6   30  Zn           0.067  0.000  0.067  0.000  0.067  0.000  0.067  0.000
  7440-38-2   33  As           0.008  0.000  0.008  0.000  0.008  0.000  0.008  0.000
  7726-95-6   35  Br           0.180  0.000  0.180  0.000  0.180  0.000  0.180  0.000
  7440-17-7   37  Rb           0.009  0.000  0.009  0.000  0.009  0.000  0.009  0.000
  7440-22-4   47  Ag           0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.000
  7440-43-9   48  Cd           0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-36-0   51  Sb           0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-46-2   55  Cs           0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-39-3   56  Ba           0.066  0.000  0.066  0.000  0.066  0.000  0.066  0.000
  7439-92-1   82  Pb           0.035  0.000  0.035  0.000  0.035  0.000  0.035  0.000
------------------------------------------------------------------------------------
TOTALS:                       48.061        48.061        48.061        48.061
====================================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : External Combustion - Heavy Oil-Fired Boiler Composite
Profile Number : 13502
Data Quality : E

Control Device : Seven uncontrolled and five FGD.
Reference(s) : 3,11
Data Source : Composite of 13 heavy oil-fired boilers in Japan. Samples collected on PTFE filters and analyzed using XRF and INAA.

SCC Assignments: 10200401

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.560	0.770	0.860

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um(1) %wt	0-2.5 um(1) unc	2.5-10 um(1) %wt	2.5-10 um(1) unc	0-10 um(1) %wt	0-10 um(1) unc	Total Measured %wt	Total Measured unc
7440-23-5	11	Na	1.000	0.000	1.000	0.000	1.000	0.000	1.000	0.000
7439-95-4	12	Mg	NR	0.000	NR	0.000	NR	0.000	0.000	0.000
7429-90-5	13	Al	0.210	0.000	0.210	0.000	0.210	0.000	0.210	0.000
7704-34-9	16	S	9.600	0.000	9.600	0.000	9.600	0.000	9.600	0.000
7782-50-5	17	Cl	0.092	0.000	0.092	0.000	0.092	0.000	0.092	0.000
7440-09-7	19	K	0.085	0.000	0.085	0.000	0.085	0.000	0.085	0.000
7440-70-2	20	Ca	0.085	0.000	0.085	0.000	0.085	0.000	0.085	0.000
7440-22-2	21	Sc	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-32-6	22	Ti	0.074	0.000	0.074	0.000	0.074	0.000	0.074	0.000
7440-62-2	23	V	0.920	0.000	0.920	0.000	0.920	0.000	0.920	0.000
7440-47-3	24	Cr	0.021	0.000	0.021	0.000	0.021	0.000	0.021	0.000
7439-96-5	25	Mn	0.012	0.000	0.012	0.000	0.012	0.000	0.012	0.000
7439-89-6	26	Fe	0.460	0.000	0.460	0.000	0.460	0.000	0.460	0.000
7440-48-4	27	Co	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000
7440-02-0	28	Ni	0.490	0.000	0.490	0.000	0.490	0.000	0.490	0.000
7440-50-8	29	Cu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-66-6	30	Zn	0.040	0.000	0.040	0.000	0.040	0.000	0.040	0.000
7440-38-2	33	As	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7726-95-6	35	Br	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-17-7	37	Rb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-22-4	47	Ag	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-36-0	51	Sb	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-46-2	55	Cs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	0.092	0.000	0.092	0.000	0.092	0.000	0.092	0.000
7439-91-0	57	La	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	0.033	0.000	0.033	0.000	0.033	0.000	0.033	0.000
TOTALS:			13.221		13.221		13.221		13.221	

(1) Estimated / extrapolated.

```
PM Profile Speciation Report
-----------------------------------------------------------------------------
Profile Name   : External Combustion - Indonesian Oil-Fired Boiler Composite
Profile Number : 13503
Data Quality   : E
-----------------------------------------------------------------------------
Control Device : ESP or multicyclone plus ESP
Reference(s)   : 3,11
Data Source    : Composite of three Indonesian oil-fired boilers in Japan.
                 Samples collected on PTFE filters and analyzed using XRF and
                 INAA.

SCC Assignments: 10200401

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :      0.410         0.520          0.630
-----------------------------------------------------------------------------
Total Particulate Matter -
                                                                       Total
                              0-2.5 um(1)   2.5-10 um(1)   0-10 um(1)    Measured
              Species         -----------   ------------   -----------   -----------
 CAS Number   Num   Sym       %wt    unc    %wt    unc     %wt    unc    %wt    unc
-----------------------------------------------------------------------------
  7440-23-5   11    Na       2.200  0.000   2.200  0.000   2.200  0.000   2.200  0.000
  7439-95-4   12    Mg       0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
  7429-90-5   13    Al       0.540  0.000   0.540  0.000   0.540  0.000   0.540  0.000
  7704-34-9   16    S       11.000  0.000  11.000  0.000  11.000  0.000  11.000  0.000
  7782-50-5   17    Cl       1.200  0.000   1.200  0.000   1.200  0.000   1.200  0.000
  7440-09-7   19    K        0.140  0.000   0.140  0.000   0.140  0.000   0.140  0.000
  7440-70-2   20    Ca       0.860  0.000   0.860  0.000   0.860  0.000   0.860  0.000
  7440-22-2   21    Sc       0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
  7440-32-6   22    Ti       0.110  0.000   0.110  0.000   0.110  0.000   0.110  0.000
  7440-62-2   23    V        0.067  0.000   0.067  0.000   0.067  0.000   0.067  0.000
  7440-47-3   24    Cr       0.042  0.000   0.042  0.000   0.042  0.000   0.042  0.000
  7439-96-5   25    Mn       0.014  0.000   0.014  0.000   0.014  0.000   0.014  0.000
  7439-89-6   26    Fe       1.300  0.000   1.300  0.000   1.300  0.000   1.300  0.000
  7440-48-4   27    Co       0.070  0.000   0.070  0.000   0.070  0.000   0.070  0.000
  7440-02-0   28    Ni       2.400  0.000   2.400  0.000   2.400  0.000   2.400  0.000
  7440-50-8   29    Cu       0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
  7440-66-6   30    Zn       0.130  0.000   0.130  0.000   0.130  0.000   0.130  0.000
  7440-38-2   33    As       0.025  0.000   0.025  0.000   0.025  0.000   0.025  0.000
  7726-95-6   35    Br       0.039  0.000   0.039  0.000   0.039  0.000   0.039  0.000
  7440-17-7   37    Rb       0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
  7440-22-4   47    Ag       0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
  7440-43-9   48    Cd       0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
  7440-36-0   51    Sb       0.003  0.000   0.003  0.000   0.003  0.000   0.003  0.000
  7440-46-2   55    Cs       0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
  7440-39-3   56    Ba       0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
  7439-91-0   57    La       0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
  7439-92-1   82    Pb       0.380  0.000   0.380  0.000   0.380  0.000   0.380  0.000
-----------------------------------------------------------------------------
TOTALS:                     20.520         20.520         20.520         20.520
=============================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Oil-Fired Boiler
Profile Number : 13504
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1
Data Source : Unspecified methodology.

SCC Assignments: 10200401

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.560	0.770	0.860

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	1.203	0.120	2.217	0.222	1.557	0.282	1.541	0.154
7440-21-3	14	Si	2.077	0.208	4.505	0.451	2.924	0.538	2.879	0.288
7723-14-0	15	P	0.398	0.073	0.151	0.050	0.312	0.077	0.316	0.065
7704-34-9	16	S	13.074	1.307	1.761	0.280	9.127	1.498	9.321	0.932
7782-50-5	17	Cl	0.000	0.056	0.000	0.028	0.000	0.043	0.000	0.047
7440-09-7	19	K	0.056	0.006	0.046	0.008	0.053	0.016	0.053	0.006
7440-70-2	20	Ca	0.208	0.021	0.571	0.057	0.334	0.078	0.329	0.043
7440-32-6	22	Ti	0.079	0.009	0.168	0.017	0.110	0.032	0.108	0.011
7440-62-2	23	V	1.004	0.100	0.689	0.069	0.894	0.143	0.898	0.090
7440-47-3	24	Cr	0.003	0.012	0.028	0.013	0.011	0.017	0.011	0.012
7439-96-5	25	Mn	0.011	0.002	0.018	0.004	0.013	0.009	0.013	0.003
7439-89-6	26	Fe	0.357	0.036	0.696	0.070	0.475	0.097	0.470	0.047
7440-02-0	28	Ni	1.595	0.160	1.508	0.151	1.565	0.250	1.564	0.156
7440-50-8	29	Cu	0.051	0.008	0.120	0.013	0.075	0.026	0.074	0.010
7440-66-6	30	Zn	0.052	0.005	0.017	0.004	0.040	0.010	0.041	0.004
7440-55-3	31	Ga	0.008	0.002	0.002	0.002	0.006	0.003	0.006	0.002
7440-38-2	33	As	0.034	0.005	0.002	0.006	0.023	0.007	0.023	0.005
7782-49-2	34	Se	0.004	0.001	0.002	0.002	0.003	0.003	0.003	0.002
7726-95-6	35	Br	0.005	0.002	0.005	0.003	0.005	0.005	0.005	0.002
7440-17-7	37	Rb	0.003	0.002	0.002	0.003	0.003	0.004	0.003	0.002
7440-24-6	38	Sr	0.011	0.002	0.030	0.005	0.018	0.011	0.017	0.003
7440-65-5	39	Y	0.003	0.004	0.004	0.006	0.004	0.007	0.004	0.005
7440-67-7	40	Zr	0.018	0.015	0.006	0.020	0.014	0.019	0.014	0.014
7439-98-7	42	Mo	0.024	0.008	0.008	0.015	0.019	0.014	0.019	0.011
7440-05-3	46	Pd	0.017	0.017	0.019	0.012	0.017	0.017	0.017	0.010
7440-22-4	47	Ag	0.001	0.011	0.001	0.020	0.001	0.017	0.001	0.014
7440-43-9	48	Cd	0.000	0.015	0.000	0.026	0.000	0.023	0.000	0.018
7440-74-6	49	In	0.001	0.014	0.053	0.028	0.019	0.028	0.019	0.019
7440-31-5	50	Sn	0.003	0.018	0.003	0.034	0.003	0.030	0.003	0.023
7440-36-0	51	Sb	0.019	0.031	0.014	0.056	0.017	0.050	0.018	0.039
7440-39-3	56	Ba	0.020	0.085	0.010	0.155	0.017	0.137	0.018	0.108
7439-91-0	57	La	0.094	0.124	0.177	0.230	0.123	0.204	0.117	0.159
7439-97-6	80	Hg	0.001	0.002	0.002	0.004	0.002	0.004	0.002	0.003
7439-92-1	82	Pb	0.032	0.006	0.012	0.009	0.025	0.011	0.026	0.007
	201	OC	8.960	0.896	5.630	0.563	7.798	1.176	7.850	0.785
	202	EC	8.690	0.869	80.200	8.020	33.635	8.391	32.500	3.250
TOTALS:			38.116		98.677		59.242		58.283	

(1) No control specified: thus, assumed uncontrolled.
(2) Calculation based on methodology described in the Air Emissions Species Manual, Volume II.

```
PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : External Combustion - Waste Oil-Fired Boiler
Profile Number : 14101
Data Quality   : E
------------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 3,11
Data Source    : Boiler firing waste oil in Japan. Samples collected on PTFE
                 filters and analyzed using XRF and INAA.

SCC Assignments: 10201302

Mass Fraction Data -  Size Interval (um) :   (0-2.5)(2)      (0-6)(2)     (0-10)(2)
                      Mass Fraction      :     0.520           0.580        0.710
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                                  0-2.5 um(3)  2.5-10 um(3)   0-10 um(3)    Measured
                   Species       -----------  -----------   -----------  -----------
 CAS Number    Num   Sym           %wt   unc     %wt   unc     %wt   unc     %wt   unc
------------------------------------------------------------------------------
  7440-23-5    11    Na          1.500 0.000   1.500 0.000   1.500 0.000   1.500 0.000
  7439-95-4    12    Mg          0.710 0.000   0.710 0.000   0.710 0.000   0.710 0.000
  7429-90-5    13    Al          0.330 0.000   0.330 0.000   0.330 0.000   0.330 0.000
  7704-34-9    16    S          15.000 0.000  15.000 0.000  15.000 0.000  15.000 0.000
  7782-50-5    17    Cl          3.600 0.000   3.600 0.000   3.600 0.000   3.600 0.000
  7440-09-7    19    K           4.200 0.000   4.200 0.000   4.200 0.000   4.200 0.000
  7440-70-2    20    Ca          4.000 0.000   4.000 0.000   4.000 0.000   4.000 0.000
  7440-22-2    21    Sc          0.000 0.000   0.000 0.000   0.000 0.000   0.000 0.000
  7440-32-6    22    Ti          0.013 0.000   0.013 0.000   0.013 0.000   0.013 0.000
  7440-62-2    23    V           0.002 0.000   0.002 0.000   0.002 0.000   0.002 0.000
  7440-47-3    24    Cr          0.021 0.000   0.021 0.000   0.021 0.000   0.021 0.000
  7439-96-5    25    Mn          0.074 0.000   0.074 0.000   0.074 0.000   0.074 0.000
  7439-89-6    26    Fe          1.000 0.000   1.000 0.000   1.000 0.000   1.000 0.000
  7440-48 4    27    Co          0.001 0.000   0.001 0.000   0.001 0.000   0.001 0.000
  7440-02-0    28    Ni          0.007 0.000   0.007 0.000   0.007 0.000   0.007 0.000
  7440-50-8    29    Cu          0.150 0.000   0.150 0.000   0.150 0.000   0.150 0.000
  7440-66-6    30    Zn          0.850 0.000   0.850 0.000   0.850 0.000   0.850 0.000
  7440-38-2    33    As          0.000 0.000   0.000 0.000   0.000 0.000   0.000 0.000
  7726-95-6    35    Br          0.220 0.000   0.220 0.000   0.220 0.000   0.220 0.000
  7440-17-7    37    Rb          0.017 0.000   0.017 0.000   0.017 0.000   0.017 0.000
  7440-22-4    47    Ag          0.001 0.000   0.001 0.000   0.001 0.000   0.001 0.000
  7440-43-9    48    Cd          0.012 0.000   0.012 0.000   0.012 0.000   0.012 0.000
  7440-36-0    51    Sb          0.003 0.000   0.003 0.000   0.003 0.000   0.003 0.000
  7440-46-2    55    Cs          0.000 0.000   0.000 0.000   0.000 0.000   0.000 0.000
  7440-39-3    56    Ba          0.710 0.000   0.710 0.000   0.710 0.000   0.710 0.000
  7439-91-0    57    La          0.000 0.000   0.000 0.000   0.000 0.000   0.000 0.000
  7439-92-1    82    Pb          1.900 0.000   1.900 0.000   1.900 0.000   1.900 0.000
------------------------------------------------------------------------------
TOTALS:                         34.321        34.321        34.321        34.321
==============================================================================
(1)  No control specified: thus, assumed uncontrolled.
(2)  Mass fraction data for uncontrolled residual oil firing.
(3)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : External Combustion - Liquid Waste-Fired Boiler
Profile Number : 14102
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 3,11
Data Source : Boiler firing pitch in Japan. Samples collected on PTFE filters and analyzed using XRF and INAA.

SCC Assignments: 10201301

Mass Fraction Data -			
Size Interval (um) :	(0-2.5)(2)	(0-6)(2)	(0-10)(2)
Mass Fraction :	0.560	0.770	0.860

Total Particulate Matter -

	Species		0-2.5 um(3)		2.5-10 um(3)		0-10 um(3)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	15.000	0.000	15.000	0.000	15.000	0.000	15.000	0.000
7439-95-4	12	Mg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7429-90-5	13	Al	0.450	0.000	0.450	0.000	0.450	0.000	0.450	0.000
7704-34-9	16	S	25.000	0.000	25.000	0.000	25.000	0.000	25.000	0.000
7782-50-5	17	Cl	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-09-7	19	K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-70-2	20	Ca	1.300	0.000	1.300	0.000	1.300	0.000	1.300	0.000
7440-22-2	21	Sc	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-32-6	22	Ti	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-62-2	23	V	1.200	0.000	1.200	0.000	1.200	0.000	1.200	0.000
7440-47-3	24	Cr	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.000
7439-96-5	25	Mn	0.030	0.000	0.030	0.000	0.030	0.000	0.030	0.000
7439-89-6	26	Fe	1.700	0.000	1.700	0.000	1.700	0.000	1.700	0.000
7440-48-4	27	Co	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.000
7440-02-0	28	Ni	1.500	0.000	1.500	0.000	1.500	0.000	1.500	0.000
7440-50-8	29	Cu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-66-6	30	Zn	0.066	0.000	0.066	0.000	0.066	0.000	0.066	0.000
7440-38-2	33	As	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000
7726-95-6	35	Br	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-17-7	37	Rb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-22-4	47	Ag	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-36-0	51	Sb	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7440-46-2	55	Cs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	0.100	0.000	0.100	0.000	0.100	0.000	0.100	0.000
TOTALS:			46.382		46.382		46.382		46.382	

(1) No control specified: thus, assumed uncontrolled.
(2) Mass fraction data for uncontrolled residual oil-fired boiler.
(3) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : External Combustion - Solid Waste-Fired Boiler
Profile Number : 15101
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 3,11
Data Source : Boiler firing miscellaneous fuel (primarily wood and building materials) in Japan. Samples collected on PTFE filters and analyzed using XRF and INAA.

SCC Assignments: 10201201

Mass Fraction Data -		(0-2.5)(2)	(0-6)(2)	(0-10)(2)
	Size Interval (um) :	(0-2.5)(2)	(0-6)(2)	(0-10)(2)
	Mass Fraction :	0.760	0.860	0.900

Total Particulate Matter -

	Species		0-2.5 um(3)		2.5-10 um(3)		0-10 um(3)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.840	0.000	0.840	0.000	0.840	0.000	0.840	0.000
7439-95-4	12	Mg	2.100	0.000	2.100	0.000	2.100	0.000	2.100	0.000
7429-90-5	13	Al	0.220	0.000	0.220	0.000	0.220	0.000	0.220	0.000
7704-34-9	16	S	9.100	0.000	9.100	0.000	9.100	0.000	9.100	0.000
7782-50-5	17	Cl	6.800	0.000	6.800	0.000	6.800	0.000	6.800	0.000
7440-09-7	19	K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-70-2	20	Ca	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
7440-22-2	21	Sc	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-32-6	22	Ti	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-62-2	23	V	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-47-3	24	Cr	0.063	0.000	0.063	0.000	0.063	0.000	0.063	0.000
7439-96-5	25	Mn	0.016	0.000	0.016	0.000	0.016	0.000	0.016	0.000
7439-89-6	26	Fe	0.980	0.000	0.980	0.000	0.980	0.000	0.980	0.000
7440-48-4	27	Co	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-02-0	28	Ni	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.000
7440-50-8	29	Cu	0.190	0.000	0.190	0.000	0.190	0.000	0.190	0.000
7440-66-6	30	Zn	8.400	0.000	8.400	0.000	8.400	0.000	8.400	0.000
7440-38-2	33	As	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7726-95-6	35	Br	0.310	0.000	0.310	0.000	0.310	0.000	0.310	0.000
7440-17-7	37	Rb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-22-4	47	Ag	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7440-43-9	48	Cd	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.000
7440-36-0	51	Sb	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.000
7440-46-2	55	Cs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	2.000	0.000	2.000	0.000	2.000	0.000	2.000	0.000
7439-92-1	82	Pb	2.000	0.000	2.000	0.000	2.000	0.000	2.000	0.000
TOTALS:			51.047		51.047		51.047		51.047	

---

(1) No control specified: thus, assumed uncontrolled.
(2) Mass fraction data for uncontrolled residual wood/bark-fired boiler.
(3) Estimated / extrapolated.

3.2 CHEMICAL MANUFACTURING

The manufacture of organic and inorganic chemicals involves the production of a wide variety of end-product and intermediate chemicals. Emissions from the chemical manufacturing industry can be high but are usually recovered for economic reasons. The particulate emissions are usually very finely sized and difficult to remove. Emission sources can include storage and handling operations, reactor processes, separation processes, and fugitive and secondary sources.

PM Profile Speciation Report

Profile Name : Fertilizer Production - Phosphate Rock Dust
Profile Number : 25408
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30102803, 30102804, 30102923, 30102924

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.150	0.340	0.510

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	NR	0.000	0.340	0.020	NE	0.000	0.306	0.018
7439-95-4	12	Mg	NR	0.000	0.130	0.010	NE	0.000	0.117	0.009
7429-90-5	13	Al	2.543	0.254	2.099	0.210	2.230	0.186	2.143	0.194
7440-21-3	14	Si	3.349	0.335	2.482	0.248	2.737	0.232	2.568	0.230
7723-14-0	15	P	11.152	2.231	9.547	1.910	10.019	1.342	9.706	1.741
7704-34-9	16	S	1.285	0.129	0.882	0.088	1.000	0.087	0.922	0.082
7782-50-5	17	Cl	0.364	0.040	0.411	0.041	0.397	0.035	0.407	0.038
7440-09-7	19	K	0.368	0.042	0.203	0.034	0.251	0.029	0.219	0.031
7440-70-2	20	Ca	19.872	1.987	22.922	2.292	22.025	1.742	22.620	2.096
7440-32-6	22	Ti	1.057	0.106	0.842	0.084	0.905	0.077	0.863	0.078
7440-62-2	23	V	0.138	0.034	0.099	0.026	0.110	0.020	0.103	0.024
7440-47-3	24	Cr	0.108	0.011	0.087	0.009	0.093	0.010	0.089	0.008
7439-96-5	25	Mn	0.332	0.033	0.188	0.019	0.230	0.022	0.202	0.018
7439-89-6	26	Fe	7.579	0.758	4.162	0.416	5.167	0.466	4.501	0.392
7440-02-0	28	Ni	0.032	0.005	0.014	0.003	0.020	0.004	0.016	0.003
7440-50-8	29	Cu	0.032	0.006	0.011	0.003	0.017	0.003	0.013	0.003
7440-66-6	30	Zn	0.086	0.009	0.049	0.005	0.060	0.007	0.052	0.005
7440-55-3	31	Ga	0.000	0.003	0.003	0.001	0.002	0.002	0.003	0.001
7440-38-2	33	As	0.000	0.013	0.000	0.004	0.000	0.004	0.000	0.004
7782-49-2	34	Se	0.001	0.003	0.000	0.001	0.000	0.001	0.000	0.001
7726-95-6	35	Br	0.025	0.004	0.003	0.002	0.009	0.002	0.005	0.002
7440-17-7	37	Rb	0.003	0.004	0.004	0.002	0.004	0.002	0.004	0.002
7440-24-6	38	Sr	0.551	0.055	0.706	0.071	0.660	0.055	0.690	0.064
7440-65-5	39	Y	0.029	0.006	0.034	0.004	0.033	0.005	0.033	0.003
7440-67-7	40	Zr	0.127	0.039	0.088	0.036	0.100	0.024	0.092	0.033
7439-98-7	42	Mo	0.002	0.018	0.009	0.009	0.007	0.008	0.009	0.008
7440-05-3	46	Pd	0.004	0.019	0.011	0.009	0.009	0.008	0.011	0.008
7440-22-4	47	Ag	0.000	0.023	0.000	0.012	0.000	0.009	0.000	0.011
7440-43-9	48	Cd	0.000	0.032	0.011	0.016	0.007	0.013	0.010	0.015
7440-74-6	49	In	0.049	0.036	0.000	0.018	0.014	0.015	0.005	0.016
7440-31-5	50	Sn	0.038	0.044	0.025	0.023	0.029	0.018	0.026	0.021
7440-36-0	51	Sb	0.131	0.077	0.000	0.036	0.038	0.031	0.013	0.034
7440-39-3	56	Ba	1.531	0.263	1.873	0.187	1.772	0.156	1.839	0.172
7439-91-0	57	La	0.491	0.324	0.000	0.172	0.144	0.135	0.049	0.159
7439-97-6	80	Hg	0.005	0.004	0.004	0.003	0.004	0.002	0.004	0.003
7439-92-1	82	Pb	0.143	0.017	0.035	0.001	0.066	0.009	0.045	0.002
7440-69-9	83	Bi	NR	0.000	0.000	0.020	NE	0.000	0.000	0.018
TOTALS:			51.427		47.274		48.159		47.685	

(1) No control specified: thus, assumed uncontrolled.
(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

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```
PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Ammonium Nitrate - Prill Tower
Profile Number : 25409
Data Quality   : E
--------------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1,17
Data Source    : Data taken from Reference 1. For details, consult Reference
                 17.

SCC Assignments: 30102712

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.560         0.730           0.830
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                          Total
                                 0-2.5 um(2)   2.5-10 um(2)   0-10 um(2)    Measured
                 Species         ------------  ------------  ------------  ------------
 CAS Number   Num    Sym          %wt    unc     %wt    unc    %wt    unc    %wt    unc
--------------------------------------------------------------------------------
              204    NO3        77.500  0.000  77.500  0.000  77.500  0.000  77.500  7.750
--------------------------------------------------------------------------------
TOTALS:                         77.500         77.500         77.500         77.500
================================================================================
(1)  No control specified: thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
```

```
PM Profile Speciation Report
-----------------------------------------------------------------------------
Profile Name   : Ammonium Sulfate Production
Profile Number : 25410
Data Quality   : E
-----------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1,17
Data Source    : Data taken from Reference 1. For details, consult Reference
                 17.

SCC Assignments: 30113004, 30113005

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.110         0.490           0.990
-----------------------------------------------------------------------------
Total Particulate Matter -
                                                                          Total
                                 0-2.5 um(2)  2.5-10 um(2)  0-10 um(2)   Measured
               Species          ------------ ------------ ------------ ------------
 CAS Number  Num   Sym           %wt    unc    %wt    unc    %wt    unc    %wt    unc
-----------------------------------------------------------------------------
  7704-34-9   16    S             NE 24.200     NE 26.155     NE 24.200  2.420  7.750
             203    SO4       72.700  0.000 72.700  0.000 72.700  0.000 72.700  7.270
-----------------------------------------------------------------------------
TOTALS:                       72.700        72.700        72.700        75.120
=============================================================================
(1)  No control specified: thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Diammonium Phoshate Plant
Profile Number : 25411
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30103001, 30103002, 30103003, 30103004

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.300	0.620	0.850

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-41-7	4	Be	0.000	0.023	NR	0.000	NE	0.000	NR	0.000
7440-42-8	5	B	0.092	0.092	NR	0.000	NE	0.000	NR	0.000
7782-41-4	9	F	0.000	0.092	NR	0.000	NE	0.000	NR	0.000
7440-23-5	11	Na	0.270	0.900	NR	0.000	NE	0.000	NR	0.000
7439-95-4	12	Mg	0.023	0.012	NR	0.000	NE	0.000	NR	0.000
7429-90-5	13	Al	1.103	0.221	3.561	0.890	2.693	0.555	1.330	0.332
7440-21-3	14	Si	25.806	5.161	39.441	9.860	34.629	6.424	27.063	6.766
7723-14-0	15	P	0.725	0.145	4.541	1.337	3.194	0.816	1.077	0.269
7704-34-9	16	S	4.687	0.937	5.327	1.332	5.101	0.912	4.746	1.187
7782-50-5	17	Cl	5.868	1.174	4.271	1.068	4.835	0.829	5.721	1.430
7440-09-7	19	K	0.602	0.120	2.105	0.526	1.575	0.329	0.741	0.185
7440-70-2	20	Ca	0.617	0.123	6.520	1.630	4.437	1.000	1.162	0.290
7440-32-6	22	Ti	0.020	0.004	0.199	0.056	0.136	0.037	0.037	0.009
7440-62-2	23	V	0.042	0.008	0.035	0.026	0.037	0.017	0.041	0.010
7440-47-3	24	Cr	0.006	0.003	0.000	0.025	0.002	0.015	0.006	0.005
7439-96-5	25	Mn	0.024	0.005	0.151	0.042	0.106	0.029	0.036	0.009
7439-89-6	26	Fe	0.925	0.185	3.551	0.888	2.624	0.551	1.168	0.292
7440-48-4	27	Co	0.000	0.210	NR	0.000	NE	0.074	NR	0.000
7440-02-0	28	Ni	0.013	0.004	0.000	0.028	0.005	0.017	0.011	0.006
7440-50-8	29	Cu	0.023	0.005	0.251	0.066	0.171	0.043	0.044	0.011
7440-66-6	30	Zn	0.096	0.019	0.091	0.041	0.093	0.028	0.096	0.024
7440-55-3	31	Ga	0.001	0.002	0.000	0.018	0.000	0.011	0.001	0.004
7440-38-2	33	As	0.019	0.009	0.000	0.064	0.007	0.038	0.018	0.014
7782-49-2	34	Se	0.000	0.003	0.000	0.027	0.000	0.016	0.000	0.005
7726-95-6	35	Br	0.022	0.004	0.000	0.029	0.008	0.017	0.020	0.006
7440-17-7	37	Rb	0.000	0.003	0.000	0.034	0.000	0.020	0.000	0.006
7440-24-6	38	Sr	0.015	0.004	0.229	0.062	0.153	0.041	0.003	0.008
7440-65-5	39	Y	0.000	0.005	0.000	0.049	0.000	0.029	0.000	0.009
7440-67-7	40	Zr	0.011	0.021	0.000	0.212	0.004	0.126	0.010	0.038
7439-98-7	42	Mo	0.028	0.015	0.334	0.172	0.226	0.105	0.056	0.029
7440-05-3	46	Pd	0.011	0.011	0.340	0.150	0.224	0.092	0.041	0.023
7440-22-4	47	Ag	0.000	0.020	0.077	0.220	0.050	0.131	0.007	0.038
7440-43-9	48	Cd	0.000	0.027	0.439	0.320	0.284	0.192	0.041	0.053
7440-74-6	49	In	0.012	0.030	0.000	0.302	0.004	0.180	0.011	0.055
7440-31-5	50	Sn	0.000	0.037	0.000	0.390	0.000	0.232	0.000	0.070

PM Profile Speciation Report - continued (profile 25411)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um(2) %wt	0-10 um(2) unc	Total Measured %wt	Total Measured unc
7440-36-0	51	Sb	0.000	0.064	0.000	0.675	0.000	0.402	0.000	0.120
7440-39-3	56	Ba	0.000	0.172	0.000	1.810	0.000	1.077	0.000	0.323
7439-91-0	57	La	0.000	0.239	4.411	2.769	2.854	1.656	0.407	0.462
7439-97-6	80	Hg	0.005	0.005	0.000	0.037	0.002	0.022	0.047	0.076
7439-92-1	82	Pb	0.081	0.016	0.194	0.105	0.154	0.065	0.091	0.023
	203	SO4	3.220	0.810	NR	0.000	NE	0.000	NR	0.000
	204	NO3	3.780	0.950	NR	0.000	NE	0.000	NR	0.000
TOTALS:			48.147		76.068		63.608		44.032	

(1) No controlled specified: thus, assumed uncontrolled.

(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Superphosphate Plant
Profile Number : 25412
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30102823, 30102824, 30102825

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.150	0.340	0.510

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7782-41-4	9	F	52.900	5.290	NR	0.000	NE	0.000	NR	0.000
7429-90-5	13	Al	0.572	0.114	1.541	0.308	1.256	0.180	0.679	0.136
7440-21-3	14	Si	26.606	2.661	64.783	6.478	53.554	4.224	30.813	3.081
7723-14-0	15	P	0.070	0.014	0.350	0.087	0.268	0.050	0.101	0.021
7704-34-9	16	S	0.136	0.027	0.518	0.114	0.406	0.066	0.178	0.036
7782-50-5	17	Cl	1.309	0.262	3.727	0.745	3.016	0.431	1.576	0.315
7440-09-7	19	K	0.003	0.002	0.012	0.016	0.009	0.009	0.004	0.004
7440-70-2	20	Ca	0.079	0.016	0.322	0.064	0.251	0.039	0.106	0.021
7440-32-6	22	Ti	0.003	0.001	0.021	0.010	0.016	0.006	0.005	0.002
7440-62-2	23	V	0.004	0.001	0.003	0.006	0.003	0.003	0.004	0.002
7440-47-3	24	Cr	0.000	0.001	0.010	0.007	0.007	0.004	0.001	0.002
7439-96-5	25	Mn	0.001	0.001	0.001	0.007	0.001	0.004	0.001	0.002
7439-89-6	26	Fe	0.025	0.005	0.041	0.023	0.036	0.013	0.027	0.006
7440-02-0	28	Ni	0.001	0.001	0.009	0.009	0.007	0.005	0.002	0.002
7440-50-8	29	Cu	0.000	0.001	0.000	0.009	0.000	0.005	0.000	0.002
7440-66-6	30	Zn	0.001	0.001	0.004	0.007	0.003	0.004	0.002	0.002
7440-55-3	31	Ga	0.000	0.001	0.000	0.005	0.000	0.003	0.000	0.001
7440-38-2	33	As	0.059	0.012	0.000	0.017	0.017	0.010	0.052	0.010
7782-49-2	34	Se	0.000	0.001	0.000	0.007	0.000	0.004	0.000	0.002
7726-95-6	35	Br	0.005	0.001	0.022	0.009	0.017	0.006	0.007	0.002
7440-17-7	37	Rb	0.000	0.001	0.000	0.010	0.000	0.005	0.000	0.002
7440-24-6	38	Sr	0.007	0.002	0.025	0.012	0.020	0.007	0.009	0.003
7440-65-5	39	Y	0.000	0.002	0.014	0.014	0.010	0.008	0.002	0.003
7440-67-7	40	Zr	0.000	0.009	0.114	0.062	0.080	0.035	0.013	0.015
7439-98-7	42	Mo	0.018	0.007	0.031	0.044	0.027	0.024	0.020	0.011
7440-05-3	46	Pd	0.011	0.005	0.058	0.037	0.044	0.021	0.017	0.009
7440-22-4	47	Ag	0.000	0.009	0.024	0.062	0.017	0.034	0.003	0.015
7440-43-9	48	Cd	0.010	0.013	0.024	0.083	0.020	0.045	0.012	0.020
7440-74-6	49	In	0.000	0.013	0.089	0.091	0.063	0.050	0.010	0.021
7440-31-5	50	Sn	0.000	0.016	0.020	0.111	0.014	0.060	0.002	0.027
7440-36-0	51	Sb	0.000	0.028	0.000	0.190	0.000	0.103	0.000	0.046
7440-39-3	56	Ba	0.000	0.073	0.000	0.499	0.000	0.271	0.000	0.120
7439-91-0	57	La	0.111	0.109	0.601	0.732	0.457	0.399	0.165	0.178
7439-97-6	80	Hg	0.001	0.002	0.000	0.012	0.000	0.007	0.001	0.003
7439-92-1	82	Pb	0.009	0.004	0.009	0.026	0.009	0.014	0.009	0.006

```
PM Profile Speciation Report  -  continued (profile 25412)
------------------------------------------------------------------------------------
Total Particulate Matter -
                                                                          Total
                              0-2.5 um       2.5-10 um      0-10 um(2)      Measured
             Species        ------------   ------------   ------------   ------------
 CAS Number  Num   Sym        %wt    unc     %wt    unc     %wt    unc     %wt    unc
------------------------------------------------------------------------------------
             203   SO4       0.060  0.034     NR  0.000     NE  0.000      NR  0.000
             204   NO3       0.000  0.166     NR  0.000     NE  0.000      NR  0.000
------------------------------------------------------------------------------------
TOTALS:                     82.001         72.373         59.628         33.821
====================================================================================
(1)  No controlled specified: thus, assumed uncontrolled.
(2)  Calculated based on methodology described in the Air Emissions Species Manual,
     Volume II.
```

PM Profile Speciation Report

Profile Name : Superphosphate Granulation
Profile Number : 25413
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30102823

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.150	0.340	0.510

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-41-7	4	Be	0.000	0.011	NR	0.000	NE	0.000	NR	0.000
7440-42-8	5	B	0.067	0.045	NR	0.000	NE	0.000	NR	0.000
7782-41-4	9	F	0.051	0.045	NR	0.000	NE	0.000	NR	0.000
7440-23-5	11	Na	0.000	0.440	NR	0.000	NE	0.000	NR	0.000
7439-95-4	12	Mg	0.000	0.006	NR	0.000	NE	0.000	NR	0.000
7429-90-5	13	Al	0.973	0.097	3.137	0.784	2.501	0.440	1.046	0.105
7440-21-3	14	Si	5.791	1.453	10.562	3.675	9.159	2.077	5.950	1.515
7723-14-0	15	P	3.016	1.806	7.098	3.924	5.898	2.208	3.157	1.888
7704-34-9	16	S	6.112	0.813	11.579	2.895	9.971	1.646	6.295	0.841
7782-50-5	17	Cl	14.676	6.014	8.479	7.313	10.301	4.393	14.465	6.075
7440-09-7	19	K	0.051	0.006	0.131	0.102	0.108	0.056	0.054	0.009
7440-70-2	20	Ca	0.486	0.204	4.882	3.163	3.589	1.723	0.638	0.316
7440-32-6	22	Ti	0.019	0.003	0.049	0.048	0.040	0.027	0.020	0.005
7440-62-2	23	V	0.268	0.105	0.132	0.094	0.172	0.061	0.264	0.099
7440-47-3	24	Cr	0.000	0.004	0.008	0.044	0.005	0.024	0.000	0.005
7439-96-5	25	Mn	0.004	0.002	0.033	0.037	0.024	0.020	0.005	0.003
7439-89-6	26	Fe	0.052	0.008	0.302	0.224	0.228	0.122	0.061	0.010
7440-48-4	27	Co	0.000	0.091	NR	0.000	NE	0.000	NR	0.000
7440-02-0	28	Ni	0.127	0.037	0.041	0.072	0.066	0.041	0.124	0.038
7440-50-8	29	Cu	0.002	0.002	0.023	0.051	0.017	0.028	0.002	0.004
7440-66-6	30	Zn	0.006	0.003	0.014	0.032	0.012	0.018	0.006	0.003
7440-55-3	31	Ga	0.001	0.001	0.005	0.025	0.004	0.014	0.001	0.002
7440-38-2	33	As	0.043	0.028	0.000	0.086	0.013	0.047	0.042	0.027
7782-49-2	34	Se	0.000	0.002	0.000	0.038	0.000	0.021	0.000	0.003
7726-95-6	35	Br	0.033	0.007	0.002	0.045	0.011	0.025	0.032	0.006
7440-17-7	37	Rb	0.000	0.002	0.000	0.049	0.000	0.027	0.000	0.004
7440-24-6	38	Sr	0.021	0.003	0.211	0.064	0.155	0.037	0.027	0.005
7440-65-5	39	Y	0.000	0.003	0.000	0.069	0.000	0.038	0.000	0.005
7440-67-7	40	Zr	0.000	0.012	0.000	0.305	0.000	0.165	0.000	0.021
7439-98-7	42	Mo	0.016	0.009	0.367	0.230	0.264	0.126	0.028	0.016
7440-05-3	46	Pd	0.020	0.007	0.229	0.223	0.167	0.122	0.027	0.013
7440-22-4	47	Ag	0.005	0.012	0.002	0.306	0.003	0.166	0.005	0.022
7440-43-9	48	Cd	0.000	0.016	0.137	0.422	0.097	0.229	0.005	0.029
7440-74-6	49	In	0.002	0.017	0.173	0.446	0.123	0.242	0.007	0.031
7440-31-5	50	Sn	0.005	0.021	0.000	0.547	0.002	0.296	0.005	0.039

PM Profile Speciation Report - continued (profile 25413)

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-36-0	51	Sb	0.000	0.037	0.000	0.978	0.000	0.530	0.000	0.069
7440-39-3	56	Ba	0.000	0.095	0.000	2.595	0.000	1.408	0.000	0.179
7439-91-0	57	La	0.000	0.136	1.764	3.655	1.245	1.983	0.056	0.255
7439-97-6	80	Hg	0.062	0.007	0.000	0.072	0.018	0.039	0.059	0.009
7439-92-1	82	Pb	0.016	0.005	0.126	0.134	0.094	0.073	0.020	0.010
	201	OC	21.000	2.100	NR	0.000	NE	0.000	NR	0.000
	202	EC	3.230	0.323	NR	0.000	NE	0.000	NR	0.000
	203	SO4	3.430	0.343	NR	0.000	NE	0.000	NR	0.000
	204	NO3	3.140	0.314	NR	0.000	NE	0.000	NR	0.000
TOTALS:			62.725		49.486		44.287		32.401	

(1) No controlled specified: thus, assumed uncontrolled.

(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

```
PM Profile Speciation Report
---------------------------------------------------------------------------
Profile Name   : Sodium Tripolyphosphate - Cyclone Dust
Profile Number : 25414
Data Quality   : D
---------------------------------------------------------------------------
Control Device : Not Applicable(1)
Reference(s)   : 1,17
Data Source    : Data taken from Reference 1. For details, consult Reference
                 17.

SCC Assignments: 30104501

Mass Fraction Data -  Size Interval (um) :     (0-2.5)       (0-6)        (0-10)
                      Mass Fraction      :      0.300        0.620         0.850
---------------------------------------------------------------------------
Total Particulate Matter -
                                                                   Total
                               0-2.5 um     2.5-10 um    0-10 um(2)    Measured
                  Species    -----------  -----------  -----------  -----------
 CAS Number  Num  Sym         %wt    unc    %wt    unc    %wt    unc    %wt    unc
---------------------------------------------------------------------------
  7440-23-5   11   Na          NR  0.000 13.400  2.680     NE  0.000 13.400  0.000
  7439-95-4   12   Mg          NR  0.000  0.023  0.006     NE  0.000  0.023  0.000
  7429-90-5   13   Al       2.537  0.357  1.732  0.173  2.016  0.219  1.732  0.000
  7440-21-3   14   Si       0.875  0.141  1.947  0.195  1.569  0.157  1.947  0.000
  7723-14-0   15   P        2.086  0.486 11.733  2.350  8.328  1.474 11.733  0.000
  7704-34-9   16   S        0.870  0.289  0.270  0.033  0.482  0.114  0.270  0.000
  7782-50-5   17   Cl       0.380  0.118  0.048  0.013  0.165  0.047  0.048  0.000
  7440-09-7   19   K        0.479  0.091  0.036  0.006  0.192  0.041  0.036  0.000
  7440-70-2   20   Ca       0.131  0.039  0.075  0.008  0.095  0.018  0.075  0.000
  7440-32-6   22   Ti       0.006  0.018  0.006  0.002  0.006  0.007  0.006  0.000
  7440-62-2   23   V        0.044  0.016  0.004  0.002  0.018  0.007  0.004  0.000
  7440-47-3   24   Cr       0.023  0.017  0.001  0.001  0.009  0.006  0.001  0.000
  7439-96-5   25   Mn       0.000  0.017  0.014  0.002  0.009  0.007  0.014  0.000
  7439-89-6   26   Fe       0.052  0.053  0.097  0.010  0.081  0.022  0.097  0.000
  7440-48-4   27   Co       0.002  0.001     NR  0.000     NE  0.000     NE  0.000
  7440-02-0   28   Ni       0.043  0.018  0.000  0.002  0.015  0.007  0.000  0.000
  7440-50-8   29   Cu       0.122  0.032  0.132  0.013  0.128  0.020  0.132  0.000
  7440-66-6   30   Zn       0.157  0.031  0.046  0.005  0.085  0.015  0.046  0.000
  7440-55-3   31   Ga       0.000  0.014  0.000  0.002  0.000  0.005  0.000  0.000
  7440-38-2   33   As       0.000  0.063  0.005  0.006  0.003  0.023  0.005  0.000
  7782-49-2   34   Se       0.000  0.015  0.001  0.001  0.001  0.005  0.001  0.000
  7726-95-6   35   Br       0.060  0.022  0.003  0.002  0.023  0.009  0.003  0.000
  7440-17-7   37   Rb       0.000  0.023  0.005  0.002  0.003  0.009  0.005  0.000
  7440-24-6   38   Sr       0.004  0.028  0.003  0.002  0.003  0.010  0.003  0.000
  7440-65-5   39   Y        0.000  0.033  0.003  0.003  0.002  0.012  0.003  0.000
  7440-67-7   40   Zr       0.000  0.143  0.000  0.013  0.000  0.051  0.000  0.000
  7439-98-7   42   Mo       0.050  0.111  0.000  0.010  0.018  0.040  0.000  0.000
  7440-05-3   46   Pd       0.000  0.104  0.000  0.010  0.000  0.037  0.000  0.000
  7440-22-4   47   Ag       0.007  0.152  0.003  0.013  0.004  0.054  0.003  0.000
  7440-43-9   48   Cd       0.000  0.188  0.000  0.018  0.000  0.067  0.000  0.000
  7440-74-6   49   In       0.544  0.234  0.006  0.021  0.196  0.088  0.006  0.000
  7440-31-5   50   Sn       0.063  0.259  0.025  0.027  0.038  0.093  0.025  0.000
  7440-36-0   51   Sb       0.390  0.440  0.016  0.045  0.148  0.159  0.016  0.000
  7440-39-3   56   Ba       1.696  1.338  0.150  0.128  0.696  0.486  0.150  0.000
  7439-91-0   57   La       0.000  1.836  0.051  0.182  0.033  0.657  0.051  0.000
---------------------------------------------------------------------------
```

PM Profile Speciation Report - continued (profile 25414)

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7439-97-6	80	Hg	0.020	0.023	0.001	0.003	0.008	0.008	0.001	0.000
7439-92-1	82	Pb	0.615	0.112	0.072	0.008	0.264	0.051	0.072	0.000
7440-69-9	83	Bi	NR	0.000	0.000	0.005	NE	0.000	0.000	0.000
TOTALS:			11.256		29.908		14.638		29.908	

(1) No controlled specified: thus, assumed uncontrolled.

(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

```
PM Profile Speciation Report
-----------------------------------------------------------------------------
Profile Name   : NPK Fertilizer
Profile Number : 25415
Data Quality   : E
-----------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1,17
Data Source    : Data taken from Reference 1. For details, consult Reference
                 17.

SCC Assignments: 30104501

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.150         0.340           0.510
-----------------------------------------------------------------------------
Total Particulate Matter -
                                                                       Total
                                0-2.5 um     2.5-10 um     0-10 um    Measured
              Species         ------------ ------------ ------------ -----------
 CAS Number  Num   Sym         %wt    unc    %wt    unc    %wt    unc   %wt    unc
-----------------------------------------------------------------------------

  7723-14-0   15    P        20.000 0.000 20.000 0.000 20.000 0.000 20.000 10.000
  7440-09-7   19    K        18.000 0.000 18.000 0.000 18.000 0.000 18.000 10.000
-----------------------------------------------------------------------------
TOTALS:                      38.000       38.000       38.000       38.000
=============================================================================
(1)  Estimated / extrapolated.
```

3.3 PRIMARY METAL PRODUCTION

Primary metal production is the production of metals from unprocessed ore. Processes involved depend on the element of concern. Processes generating particulate emissions in this industry include smelting operations, grinding, sintering, electrolytic processes, refining, and leaching.

PM Profile Speciation Report

Profile Name : Iron Ore Dust - Sinter
Profile Number : 28304
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30300813, 30400701

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.270	0.600	0.690

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	2.634	0.263	1.139	0.114	1.724	0.200	2.244	0.323
7440-21-3	14	Si	6.447	0.645	3.308	0.331	4.537	0.504	5.628	0.796
7723-14-0	15	P	0.145	0.033	0.051	0.017	0.088	0.020	0.120	0.029
7704-34-9	16	S	1.050	0.105	0.000	0.101	0.411	0.095	0.776	0.127
7782-50-5	17	Cl	0.319	0.037	0.206	0.026	0.250	0.032	0.289	0.042
7440-09-7	19	K	0.300	0.032	0.186	0.022	0.231	0.029	0.270	0.039
7440-70-2	20	Ca	12.655	1.266	14.174	1.417	13.580	1.358	13.052	1.678
7440-32-6	22	Ti	0.290	0.029	0.280	0.028	0.283	0.033	0.287	0.038
7440-62-2	23	V	0.055	0.007	0.049	0.005	0.052	0.009	0.054	0.008
7440-47-3	24	Cr	0.094	0.009	0.103	0.010	0.099	0.014	0.096	0.012
7439-96-5	25	Mn	0.652	0.065	0.536	0.054	0.581	0.064	0.622	0.083
7439-89-6	26	Fe	27.491	2.749	32.511	3.251	30.547	3.043	28.802	3.675
7440-02-0	28	Ni	0.018	0.004	0.012	0.001	0.014	0.004	0.017	0.004
7440-50-8	29	Cu	0.053	0.007	0.015	0.002	0.030	0.006	0.043	0.007
7440-66-6	30	Zn	0.058	0.006	0.008	0.001	0.027	0.005	0.045	0.007
7440-55-3	31	Ga	0.000	0.003	0.000	0.001	0.000	0.001	0.000	0.002
7440-38-2	33	As	0.000	0.009	0.000	0.003	0.000	0.004	0.000	0.007
7782-49-2	34	Se	0.001	0.003	0.002	0.001	0.002	0.002	0.001	0.002
7726-95-6	35	Br	0.014	0.004	0.003	0.001	0.007	0.003	0.011	0.003
7440-17-7	37	Rb	0.005	0.004	0.008	0.001	0.007	0.003	0.006	0.003
7440-24-6	38	Sr	0.023	0.006	0.015	0.002	0.018	0.005	0.021	0.005
7440-65-5	39	Y	0.009	0.006	0.007	0.001	0.008	0.004	0.009	0.005
7440-67-7	40	Zr	0.000	0.027	0.009	0.005	0.006	0.012	0.002	0.020
7439-98-7	42	Mo	0.039	0.021	0.021	0.004	0.028	0.010	0.034	0.016
7440-05-3	46	Pd	0.000	0.019	0.007	0.004	0.004	0.008	0.002	0.014
7440-22-4	47	Ag	0.000	0.026	0.012	0.005	0.007	0.011	0.003	0.019
7440-43-9	48	Cd	0.082	0.040	0.039	0.009	0.055	0.018	0.070	0.031
7440-74-6	49	In	0.029	0.039	0.011	0.008	0.018	0.016	0.024	0.029
7440-31-5	50	Sn	0.030	0.049	0.000	0.010	0.012	0.020	0.022	0.036
7440-36-0	51	Sb	0.037	0.080	0.000	0.017	0.014	0.033	0.027	0.059
7440-39-3	56	Ba	0.000	0.234	0.000	0.046	0.000	0.096	0.000	0.173
7439-91-0	57	La	0.000	0.337	0.000	0.067	0.000	0.138	0.000	0.250
7439-97-6	80	Hg	0.011	0.005	0.013	0.002	0.012	0.004	0.011	0.004
7439-92-1	82	Pb	0.060	0.014	0.051	0.005	0.054	0.010	0.058	0.012
TOTALS:			52.601		52.776		52.706		52.646	

(1) No controlled specified: thus, assumed uncontrolled.
(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

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PM Profile Speciation Report

Profile Name : Steel Desulfurization Baghouse Dust
Profile Number : 28306
Data Quality : D

Control Device : Not Applicable
Reference(s) : 1,17
Data Source : Sample of baghouse dust from steel plant desulfurization unit.

SCC Assignments: 30300999

Mass Fraction Data -				
Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
Mass Fraction :	0.420	0.650	0.850

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.878	0.088	0.561	0.056	0.732	0.103	0.598	0.052
7440-21-3	14	Si	1.628	0.163	0.967	0.097	1.323	0.124	1.043	0.090
7723-14-0	15	P	0.226	0.053	0.081	0.025	0.159	0.028	0.098	0.023
7704-34-9	16	S	2.739	0.274	0.437	0.115	1.676	0.183	0.702	0.111
7782-50-5	17	Cl	0.458	0.046	0.265	0.029	0.369	0.038	0.287	0.027
7440-09-7	19	K	2.539	0.254	1.020	0.102	1.838	0.174	1.195	0.100
7440-70-2	20	Ca	25.445	2.545	21.313	2.131	23.538	2.147	21.788	1.947
7440-32-6	22	Ti	0.165	0.017	0.227	0.023	0.193	0.024	0.219	0.020
7440-62-2	23	V	0.041	0.005	0.047	0.005	0.043	0.008	0.046	0.004
7440-47-3	24	Cr	0.064	0.006	0.079	0.008	0.071	0.011	0.077	0.007
7439-96-5	25	Mn	0.277	0.028	0.221	0.022	0.251	0.027	0.228	0.020
7439-89-6	26	Fe	20.537	2.054	29.277	2.928	24.571	2.387	28.271	2.633
7440-02-0	28	Ni	0.016	0.004	0.014	0.001	0.015	0.004	0.014	0.001
7440-50-8	29	Cu	0.016	0.005	0.010	0.001	0.013	0.004	0.011	0.001
7440-66-6	30	Zn	0.091	0.009	0.034	0.003	0.065	0.009	0.041	0.003
7440-55-3	31	Ga	0.002	0.003	0.001	0.001	0.001	0.001	0.001	0.001
7440-38-2	33	As	0.000	0.008	0.000	0.004	0.000	0.004	0.000	0.004
7782-49-2	34	Se	0.004	0.003	0.002	0.001	0.003	0.002	0.002	0.001
7726-95-6	35	Br	0.006	0.003	0.004	0.001	0.005	0.002	0.004	0.001
7440-17-7	37	Rb	0.019	0.005	0.015	0.002	0.017	0.005	0.016	0.002
7440-24-6	38	Sr	0.116	0.012	0.095	0.010	0.106	0.014	0.097	0.009
7440-65-5	39	Y	0.003	0.006	0.004	0.001	0.003	0.003	0.004	0.001
7440-67-7	40	Zr	0.000	0.025	0.015	0.006	0.007	0.011	0.014	0.006
7439-98-7	42	Mo	0.013	0.019	0.018	0.003	0.015	0.008	0.017	0.004
7440-05-3	46	Pd	0.000	0.018	0.008	0.004	0.004	0.007	0.007	0.004
7440-22-4	47	Ag	0.015	0.026	0.015	0.004	0.015	0.010	0.015	0.005
7440-43-9	48	Cd	0.033	0.034	0.025	0.007	0.030	0.014	0.026	0.007
7440-74-6	49	In	0.007	0.034	0.021	0.007	0.013	0.014	0.019	0.007
7440-31-5	50	Sn	0.008	0.043	0.009	0.008	0.008	0.016	0.009	0.009
7440-36-0	51	Sb	0.063	0.073	0.000	0.013	0.034	0.027	0.007	0.014
7440-39-3	56	Ba	0.000	0.213	0.000	0.036	0.000	0.078	0.000	0.040
7439-91-0	57	La	0.000	0.301	0.030	0.055	0.014	0.111	0.027	0.059
7439-97-6	80	Hg	0.010	0.005	0.022	0.002	0.016	0.005	0.020	0.002
7439-92-1	82	Pb	0.059	0.013	0.069	0.007	0.063	0.011	0.068	0.006
TOTALS:			55.478		54.906		55.211		54.971	

(1) Calculated based on methodology in the Air Emissions Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Steel Production - Basic Oxygen Furnace
Profile Number : 28307
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30300913

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.650	0.660	0.670

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.383	0.055	0.285	0.092	0.383	0.000	0.465	0.162
7440-21-3	14	Si	1.500	0.648	1.060	0.637	1.500	0.000	1.229	0.545
7723-14-0	15	P	0.223	0.045	0.111	0.051	0.223	0.000	0.149	0.056
7704-34-9	16	S	1.525	1.126	0.019	0.198	1.525	0.000	1.129	1.261
7782-50-5	17	Cl	1.819	0.825	0.398	0.394	1.819	0.000	0.654	0.504
7440-09-7	19	K	2.803	0.554	1.421	0.536	2.803	0.000	3.636	2.803
7440-70-2	20	Ca	0.981	0.612	0.944	0.851	0.981	0.000	1.545	0.758
7440-32-6	22	Ti	0.375	0.102	0.421	0.046	0.375	0.000	0.369	0.160
7440-62-2	23	V	0.093	0.014	0.097	0.014	0.093	0.000	0.085	0.033
7440-47-3	24	Cr	0.189	0.019	0.191	0.021	0.189	0.000	0.167	0.046
7439-96-5	25	Mn	2.073	1.138	1.250	0.622	2.073	0.000	1.470	0.338
7439-89-6	26	Fe	50.131	15.178	60.592	6.059	50.131	0.000	50.199	20.979
7440-02-0	28	Ni	0.017	0.005	0.018	0.003	0.017	0.000	0.016	0.005
7440-50-8	29	Cu	0.020	0.009	0.013	0.003	0.020	0.000	0.014	0.005
7440-66-6	30	Zn	0.057	0.024	0.034	0.023	0.057	0.000	0.047	0.033
7440-55-3	31	Ga	0.007	0.006	0.003	0.003	0.007	0.000	0.005	0.003
7440-38-2	33	As	0.002	0.007	0.000	0.008	0.002	0.000	0.003	0.007
7782-49-2	34	Se	0.003	0.001	0.003	0.001	0.003	0.000	0.002	0.002
7726-95-6	35	Br	0.016	0.009	0.006	0.002	0.016	0.000	0.009	0.003
7440-17-7	37	Rb	0.022	0.004	0.020	0.008	0.022	0.000	0.027	0.011
7440-24-6	38	Sr	0.013	0.003	0.011	0.004	0.013	0.000	0.016	0.003
7440-65-5	39	Y	0.002	0.003	0.000	0.003	0.002	0.000	0.002	0.004
7440-67-7	40	Zr	0.017	0.012	0.007	0.010	0.017	0.000	0.005	0.014
7439-98-7	42	Mo	0.024	0.009	0.018	0.008	0.024	0.000	0.013	0.012
7440-05-3	46	Pd	0.020	0.008	0.017	0.009	0.020	0.000	0.030	0.017
7440-22-4	47	Ag	0.040	0.012	0.023	0.010	0.040	0.000	0.035	0.015
7440-43-9	48	Cd	0.039	0.054	0.035	0.016	0.039	0.000	0.020	0.020
7440-74-6	49	In	0.004	0.017	0.017	0.016	0.004	0.000	0.012	0.021
7440-31-5	50	Sn	0.028	0.020	0.029	0.018	0.028	0.000	0.035	0.025
7440-36-0	51	Sb	0.018	0.033	0.005	0.030	0.018	0.000	0.017	0.042
7440-39-3	56	Ba	0.059	0.090	0.019	0.078	0.059	0.000	0.083	0.112
7439-91-0	57	La	0.021	0.138	0.010	0.120	0.021	0.000	0.000	0.168
7439-97-6	80	Hg	0.014	0.003	0.011	0.004	0.014	0.000	0.012	0.007
7439-92-1	82	Pb	0.081	0.009	0.102	0.045	0.081	0.000	0.076	0.069
	201	OC	NR	0.000	NR	0.000	NE	0.000	0.440	0.044

```
PM Profile Speciation Report  -  continued (profile 28307)
----------------------------------------------------------------------------
Total Particulate Matter -
                                                                    Total
                            0-2.5 um    2.5-10 um    0-10 um(2)    Measured
             Species     ------------  ------------ ------------  ------------
 CAS Number Num  Sym      %wt   unc     %wt   unc    %wt   unc    %wt    unc
----------------------------------------------------------------------------
            202  EC         NR 0.000     NR  0.000     NE 0.000   0.000 0.030
----------------------------------------------------------------------------
TOTALS:                 62.619  67.190       62.619        62.016
============================================================================
(1)  No controlled specified: thus, assumed uncontrolled.
(2)  Calculated based on methodology described in the Air Emissions Species Manual,
     Volume II.
```

```
PM Profile Speciation Report
---------------------------------------------------------------------------
Profile Name   : Primary Copper Reverberatory Furnace - Slag Tap
Profile Number : 29203
Data Quality   : D
---------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1,18
Data Source    : Data taken from Reference 1. For details, consult Reference
                 18.

SCC Assignments: 30300514, 30499999

Mass Fraction Data - Size Interval (um) :    (0-2.5)       (0-6)        (0-10)
                     Mass Fraction      :     0.210        0.230         0.270
---------------------------------------------------------------------------
Total Particulate Matter -
                                                                   Total
                              0-2.5 um      2.5-10 um     0-10 um     Measured(2)
                Species    ------------  ------------  ------------  ------------
 CAS Number  Num   Sym       %wt    unc    %wt    unc    %wt    unc    %wt    unc
---------------------------------------------------------------------------
  7429-90-5   13   Al      0.000  0.200  0.000  1.000  0.000  0.896  0.000  0.000
  7440-21-3   14   Si      0.000  0.200  0.000  1.000  0.000  0.896  0.000  0.000
  7704-34-9   16   S       0.000  1.000  0.000  5.000  0.000  4.478  0.000  0.000
  7782-50-5   17   Cl      0.000  0.200  0.000  0.500  0.000  0.468  0.000  0.000
  7440-09-7   19   K       0.000  0.500  0.000  2.000  0.000  1.806  0.000  0.000
  7440-70-2   20   Ca      0.000  0.500  0.000  0.800  0.000  0.806  0.000  0.000
  7440-32-6   22   Ti      0.000  0.300  0.000  0.060  0.000  0.239  0.000  0.000
  7440-62-2   23   V       0.000  0.010  0.000  0.020  0.000  0.019  0.000  0.000
  7440-47-3   24   Cr      0.000  0.010  0.000  0.010  0.000  0.012  0.000  0.000
  7439-96-5   25   Mn      0.000  0.010  0.000  0.030  0.000  0.028  0.000  0.000
  7439-89-6   26   Fe      0.190  0.016  0.380  0.060  0.215  0.070  0.215  0.000
  7440-02-0   28   Ni      0.000  0.030  0.000  0.050  0.000  0.050  0.000  0.000
  7440-50-8   29   Cu      0.150  0.005  0.167  0.010  0.152  0.028  0.152  0.000
  7440-66-6   30   Zn      1.700  0.050  0.820  0.090  1.586  0.220  1.586  0.000
  7440-38-2   33   As     60.000  3.600 71.000  2.000 61.423  9.226 61.423  0.000
  7782-49-2   34   Se      0.000  0.200  0.000  0.300  0.000  0.307  0.000  0.000
  7726-95-6   35   Br      0.000  0.200  0.000  0.900  0.000  0.809  0.000  0.000
  7440-17-7   37   Rb      0.000  0.100  0.000  0.300  0.000  0.276  0.000  0.000
  7440-24-6   38   Sr      0.000  0.100  0.000  0.050  0.000  0.089  0.000  0.000
  7440-65-5   39   Y       0.000  0.100  0.000  0.200  0.000  0.193  0.000  0.000
  7439-98-7   42   Mo      0.092  0.005  0.110  0.010  0.094  0.021  0.094  0.000
  7440-22-4   47   Ag      0.011  0.002  0.000  0.030  0.010  0.027  0.010  0.000
  7440-43-9   48   Cd      0.630  0.220  0.530  0.460  0.617  0.449  0.617  0.000
  7440-74-6   49   In      0.012  0.001  0.000  0.020  0.010  0.018  0.010  0.000
  7440-31-5   50   Sn      0.130  0.021  0.210  0.020  0.140  0.037  0.140  0.000
  7440-36-0   51   Sb      1.100  0.029  0.980  0.080  1.085  0.166  1.085  0.000
 13494-80-9   52   Te      0.090  0.022  0.130  0.010  0.095  0.028  0.095  0.000
  7439-97-6   80   Hg      0.000  0.030  0.000  0.500  0.000  0.442  0.000  0.000
  7439-92-1   82   Pb      6.000  0.790  8.000  0.400  6.259  1.157  6.259  0.000
  7440-69-9   83   Bi      0.370  0.100     NR  0.000  0.322  0.088  0.322  0.000
---------------------------------------------------------------------------
TOTALS:                   70.475        82.327        72.008        72.008
===========================================================================
(1)  No controlled specified: thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Primary Copper Reverberatory Furnace - Slag Skim & Pour
Profile Number : 29204
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,19
Data Source : Data taken from Reference 1. For details, consult Reference 19.

SCC Assignments: 30300514

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.210	0.230	0.270

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(2)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.000	0.081	0.030	0.733	0.002	0.649	0.002	0.000
7440-21-3	14	Si	0.000	0.296	3.593	0.359	0.233	0.487	0.233	0.000
7723-14-0	15	P	0.000	0.097	0.000	0.291	0.000	0.267	0.000	0.000
7704-34-9	16	S	0.050	1.351	0.000	2.596	0.047	2.519	0.047	0.000
7782-50-5	17	Cl	0.000	0.209	0.000	0.345	0.000	0.345	0.000	0.000
7440-09-7	19	K	0.361	0.049	0.435	0.086	0.366	0.103	0.366	0.000
7440-70-2	20	Ca	0.000	0.338	0.123	1.151	0.008	1.048	0.008	0.000
7440-32-6	22	Ti	0.010	0.009	0.059	0.055	0.013	0.050	0.013	0.000
7440-62-2	23	V	0.003	0.003	0.175	0.021	0.014	0.028	0.014	0.000
7440-47-3	24	Cr	0.000	0.013	0.085	0.019	0.006	0.024	0.006	0.000
7439-96-5	25	Mn	0.010	0.004	0.020	0.005	0.010	0.008	0.010	0.000
7439-89-6	26	Fe	0.663	0.066	6.401	0.640	1.035	0.765	1.035	0.000
7440-02-0	28	Ni	0.000	0.049	0.115	0.057	0.008	0.065	0.008	0.000
7440-50-8	29	Cu	0.194	0.019	6.795	0.680	0.622	0.806	0.622	0.000
7440-66-6	30	Zn	24.455	2.446	13.279	1.375	23.730	3.662	23.730	0.000
7440-55-3	31	Ga	0.000	0.075	0.009	0.116	0.001	0.118	0.001	0.000
7440-38-2	33	As	15.725	1.573	11.732	1.601	15.466	2.708	15.466	0.000
7782-49-2	34	Se	0.000	0.071	0.000	0.146	0.000	0.140	0.000	0.000
7726-95-6	35	Br	0.000	0.855	0.000	1.461	0.000	1.450	0.000	0.000
7440-17-7	37	Rb	0.000	0.012	0.000	0.020	0.000	0.020	0.000	0.000
7440-24-6	38	Sr	0.004	0.004	0.001	0.008	0.004	0.008	0.004	0.000
7440-65-5	39	Y	0.021	0.054	0.007	0.080	0.020	0.082	0.020	0.000
7440-67-7	40	Zr	0.001	0.016	0.000	0.082	0.001	0.073	0.001	0.000
7439-98-7	42	Mo	0.368	0.037	0.377	0.038	0.369	0.071	0.369	0.000
7440-05-3	46	Pd	0.000	0.001	0.000	0.003	0.000	0.002	0.000	0.000
7440-22-4	47	Ag	0.000	0.004	0.003	0.017	0.000	0.016	0.000	0.000
7440-43-9	48	Cd	1.840	0.184	1.045	0.231	1.789	0.334	1.789	0.000
7440-74-6	49	In	0.061	0.007	0.083	0.025	0.062	0.027	0.062	0.000
7440-31-5	50	Sn	0.721	0.072	0.405	0.077	0.701	0.125	0.701	0.000
7440-36-0	51	Sb	1.648	0.165	1.086	0.215	1.612	0.307	1.612	0.000
7440-39-3	56	Ba	0.000	0.008	0.000	0.042	0.000	0.038	0.000	0.000
7439-91-0	57	La	0.000	0.014	0.000	0.078	0.000	0.070	0.000	0.000
7439-97-6	80	Hg	0.000	0.077	0.000	0.145	0.000	0.141	0.000	0.000
7439-92-1	82	Pb	21.951	2.195	13.763	1.376	21.420	3.374	21.420	0.000
TOTALS:			68.086		59.621		67.539		67.539	

(1) No controlled specified: thus, assumed uncontrolled.
(2) Estimated / extrapolated.

```
PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Primary Copper Converter - Secondary Hood
Profile Number : 29205
Data Quality   : D
--------------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1,18
Data Source    : Data taken from Reference 1. For details, consult Reference
                 18.

SCC Assignments: 30300515

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.120         0.320           0.590
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                                 0-2.5 um      2.5-10 um      0-10 um    Measured(2)
                    Species    ------------  ------------  ------------  ------------
 CAS Number  Num   Sym          %wt    unc    %wt    unc    %wt    unc    %wt    unc
--------------------------------------------------------------------------------

  7429-90-5   13   Al         0.000  0.200  0.000  3.000  0.000  1.354  0.000  0.000
  7440-21-3   14   Si         0.000  0.200  0.000 10.000  0.000  4.510  0.000  0.000
  7704-34-9   16   S          0.000  2.000  0.000 30.000  0.000 13.536  0.000  0.000
  7782-50-5   17   Cl         0.000  0.200  0.000  5.000  0.000  2.255  0.000  0.000
  7440-09-7   19   K          0.000  0.400  0.000  5.000  0.000  2.256  0.000  0.000
  7440-70-2   20   Ca         0.000  0.100  0.000  2.000  0.000  0.902  0.000  0.000
  7440-32-6   22   Ti         0.000  0.020  0.000  0.200  0.000  0.090  0.000  0.000
  7440-62-2   23   V          0.000  0.020  0.000  0.050  0.000  0.023  0.000  0.000
  7440-47-3   24   Cr         0.000  0.020  0.000  0.050  0.000  0.023  0.000  0.000
  7439-96-5   25   Mn         0.000  0.020     NR  0.000  0.000  0.004  0.000  0.000
  7439-89-6   26   Fe         0.260  0.190  7.100  1.200  1.113  0.563  1.113  0.000
  7440-02-0   28   Ni         0.000  0.030     NR  0.000  0.000  0.006  0.000  0.000
  7440-50-8   29   Cu         1.100  1.100  9.400  1.500  2.135  0.740  2.135  0.000
  7440-66-6   30   Zn         2.600  2.600  0.000  2.000  2.276  1.048  2.276  0.000
  7440-38-2   33   As        26.000 11.000  0.000 22.000 22.758 10.198 22.758  0.000
  7782-49-2   34   Se         0.000  0.200  0.000  0.400  0.000  0.185  0.000  0.000
  7726-95-6   35   Br         0.000  0.200  0.000  1.000  0.000  0.453  0.000  0.000
  7440-17-7   37   Rb         0.000  0.060  0.000  0.300  0.000  0.136  0.000  0.000
  7440-24-6   38   Sr         0.000  0.050  0.000  0.200  0.000  0.091  0.000  0.000
  7440-65-5   39   Y          0.000  0.090  0.000  2.000  0.000  0.902  0.000  0.000
  7439-98-7   42   Mo         0.000  0.100  0.000  0.200  0.000  0.092  0.000  0.000
  7440-22-4   47   Ag         0.260  0.360  0.160  0.040  0.248  0.076  0.248  0.000
  7440-43-9   48   Cd         0.600  0.870  0.260  0.050  0.558  0.179  0.558  0.000
  7440-74-6   49   In         0.140  0.120  0.000  0.050  0.123  0.033  0.123  0.000
  7440-31-5   50   Sn         0.530  0.320  0.420  0.080  0.516  0.077  0.516  0.000
  7440-36-0   51   Sb         3.100  2.200  1.730  0.300  2.929  0.478  2.929  0.000
 13494-80-9   52   Te         0.072  0.038  0.000  0.020  0.063  0.012  0.063  0.000
  7439-97-6   80   Hg         0.000  0.200     NR  0.000  0.000  0.041  0.000  0.000
  7439-92-1   82   Pb        28.000 13.000  0.000 20.000 24.509  9.434 24.509  0.000
  7440-69-9   83   Bi         1.000  0.920     NR  0.000  0.875  0.189  0.875  0.000
--------------------------------------------------------------------------------
TOTALS:                      63.662        19.070        58.103        58.103
================================================================================
(1)  No controlled specified: thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Primary Copper Converter - Secondary Hood
Profile Number : 29206
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,19
Data Source : Data taken from Reference 1. For details, consult Reference 19.

SCC Assignments: 30300515

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.120	0.320	0.590

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(2)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.000	0.039	0.000	0.503	0.000	0.227	0.000	0.000
7440-21-3	14	Si	0.000	0.231	0.000	1.999	0.000	0.903	0.000	0.000
7723-14-0	15	P	0.000	0.087	0.000	0.496	0.000	0.224	0.000	0.000
7704-34-9	16	S	0.000	1.393	0.000	4.031	0.000	1.840	0.000	0.000
7782-50-5	17	Cl	0.000	0.215	0.000	0.678	0.000	0.309	0.000	0.000
7440-09-7	19	K	0.133	0.017	0.310	0.043	0.145	0.023	0.145	0.000
7440-70-2	20	Ca	0.000	0.145	0.000	0.755	0.000	0.342	0.000	0.000
7440-32-6	22	Ti	0.000	0.003	0.000	0.020	0.000	0.009	0.000	0.000
7440-62-2	23	V	0.000	0.001	0.000	0.008	0.000	0.004	0.000	0.000
7440-47-3	24	Cr	0.000	0.005	0.000	0.018	0.000	0.008	0.000	0.000
7439-96-5	25	Mn	0.000	0.004	0.000	0.017	0.000	0.008	0.000	0.000
7439-89-6	26	Fe	0.039	0.004	0.283	0.028	0.055	0.016	0.055	0.000
7440-02-0	28	Ni	0.007	0.002	0.009	0.005	0.007	0.003	0.007	0.000
7440-50-8	29	Cu	0.499	0.050	1.323	0.132	0.552	0.070	0.552	0.000
7440-66-6	30	Zn	7.250	0.725	8.546	0.855	7.333	0.496	7.333	0.000
7440-55-3	31	Ga	0.024	0.035	0.000	0.091	0.023	0.041	0.023	0.000
7440-38-2	33	As	7.229	0.831	10.534	2.608	7.440	1.226	7.440	0.000
7782-49-2	34	Se	0.000	0.059	0.000	0.196	0.000	0.089	0.000	0.000
7726-95-6	35	Br	0.000	0.359	0.000	1.175	0.000	0.535	0.000	0.000
7440-17-7	37	Rb	0.000	0.006	0.000	0.020	0.000	0.009	0.000	0.000
7440-24-6	38	Sr	0.000	0.004	0.001	0.013	0.000	0.006	0.000	0.000
7440-65-5	39	Y	0.037	0.046	0.064	0.142	0.039	0.065	0.039	0.000
7440-67-7	40	Zr	0.014	0.014	0.015	0.056	0.014	0.026	0.014	0.000
7439-98-7	42	Mo	0.050	0.005	0.095	0.010	0.053	0.007	0.053	0.000
7440-05-3	46	Pd	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.000
7440-22-4	47	Ag	0.050	0.005	0.033	0.016	0.049	0.008	0.049	0.000
7440-43-9	48	Cd	0.631	0.063	0.825	0.146	0.643	0.073	0.643	0.000
7440-74-6	49	In	0.036	0.004	0.048	0.018	0.037	0.009	0.037	0.000
7440-31-5	50	Sn	0.305	0.031	0.445	0.068	0.314	0.035	0.314	0.000
7440-36-0	51	Sb	1.107	0.111	1.577	0.254	1.137	0.127	1.137	0.000
7440-39-3	56	Ba	0.000	0.004	0.000	0.030	0.000	0.013	0.000	0.000
7439-91-0	57	La	0.000	0.008	0.000	0.055	0.000	0.025	0.000	0.000
7439-97-6	80	Hg	0.000	0.025	0.000	0.094	0.000	0.043	0.000	0.000
7439-92-1	82	Pb	23.558	2.356	28.996	2.900	23.904	1.659	23.904	0.000
TOTALS:			40.969		53.104		41.745		41.745	

(1) No controlled specified: thus, assumed uncontrolled.
(2) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Primary Copper Flash Furnace - Matte & Slag Tap
Profile Number : 29207
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,19
Data Source : Data taken from Reference 1. For details, consult Reference 19.

SCC Assignments: 30300512

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.840	0.890	0.920

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(2)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.000	0.228	0.000	0.691	0.000	0.692	0.000	0.000
7440-21-3	14	Si	0.000	0.204	2.188	0.361	0.137	0.459	0.137	0.000
7723-14-0	15	P	0.000	0.088	0.000	0.167	0.000	0.178	0.000	0.000
7704-34-9	16	S	0.000	1.195	0.467	3.455	0.029	3.478	0.029	0.000
7782-50-5	17	Cl	0.000	0.185	0.000	0.536	0.000	0.539	0.000	0.000
7440-09-7	19	K	0.331	0.033	0.583	0.119	0.347	0.151	0.347	0.000
7440-70-2	20	Ca	0.000	0.508	0.000	2.104	0.000	2.063	0.000	0.000
7440-32-6	22	Ti	0.000	0.020	0.000	0.222	0.000	0.213	0.000	0.000
7440-62-2	23	V	0.000	0.007	0.000	0.046	0.000	0.044	0.000	0.000
7440-47-3	24	Cr	0.018	0.002	0.123	0.012	0.025	0.035	0.025	0.000
7439-96-5	25	Mn	0.013	0.002	0.042	0.009	0.015	0.020	0.015	0.000
7439-89-6	26	Fe	2.688	0.269	7.085	0.709	2.962	1.054	2.962	0.000
7440-02-0	28	Ni	0.000	0.004	0.023	0.015	0.002	0.020	0.002	0.000
7440-50-8	29	Cu	3.354	0.335	8.420	0.842	3.670	1.259	3.670	0.000
7440-66-6	30	Zn	9.767	0.977	7.812	1.403	9.645	2.180	9.645	0.000
7440-55-3	31	Ga	0.000	0.087	0.000	0.265	0.000	0.265	0.000	0.000
7440-38-2	33	As	32.785	3.279	31.823	5.174	32.725	7.746	32.725	0.000
7782-49-2	34	Se	0.000	0.098	0.000	0.343	0.000	0.339	0.000	0.000
7726-95-6	35	Br	2.532	0.253	0.000	5.961	2.374	5.710	2.374	0.000
7440-17-7	37	Rb	0.000	0.032	0.000	0.090	0.000	0.090	0.000	0.000
7440-24-6	38	Sr	0.000	0.004	0.000	0.014	0.000	0.014	0.000	0.000
7440-65-5	39	Y	0.000	0.107	0.000	0.274	0.000	0.279	0.000	0.000
7440-67-7	40	Zr	0.000	0.069	0.000	0.221	0.000	0.220	0.000	0.000
7439-98-7	42	Mo	0.161	0.016	0.154	0.031	0.160	0.054	0.160	0.000
7440-05-3	46	Pd	0.000	0.001	0.000	0.004	0.000	0.004	0.000	0.000
7440-22-4	47	Ag	0.024	0.004	0.086	0.029	0.028	0.039	0.028	0.000
7440-43-9	48	Cd	1.679	0.169	1.257	0.465	1.652	0.539	1.652	0.000
7440-74-6	49	In	0.031	0.006	0.000	0.037	0.029	0.036	0.029	0.000
7440-31-5	50	Sn	0.423	0.043	0.427	0.136	0.424	0.162	0.424	0.000
7440-36-0	51	Sb	1.991	0.229	2.014	0.658	1.992	0.745	1.992	0.000
7440-39-3	56	Ba	0.000	0.008	0.000	0.067	0.000	0.064	0.000	0.000
7439-91-0	57	La	0.000	0.014	0.000	0.124	0.000	0.119	0.000	0.000
7439-97-6	80	Hg	0.000	0.196	0.000	0.592	0.000	0.594	0.000	0.000
7439-92-1	82	Pb	12.464	1.246	11.596	1.791	12.410	2.833	12.410	0.000
TOTALS:			68.261		74.100		68.626		68.626	

(1) No controlled specified: thus, assumed uncontrolled.
(2) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Primary Copper - Process Stack
Profile Number : 29208
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,18
Data Source : Data taken from Reference 1. For details, consult Reference 18.

SCC Assignments: 30300524

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.970	1.000	1.000

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(2)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.000	0.200	0.000	2.000	0.000	1.979	0.000	0.000
7440-21-3	14	Si	0.000	0.200	0.000	1.000	0.000	1.004	0.000	0.000
7704-34-9	16	S	0.000	2.000	0.000	2.000	0.000	2.765	0.000	0.000
7782-50-5	17	Cl	0.000	0.300	0.000	0.500	0.000	0.572	0.000	0.000
7440-09-7	19	K	0.000	0.500	0.000	0.500	0.000	0.691	0.000	0.000
7440-70-2	20	Ca	0.000	0.800	0.000	2.000	0.000	2.117	0.000	0.000
7440-32-6	22	Ti	0.000	0.100	0.000	0.200	0.000	0.220	0.000	0.000
7440-62-2	23	V	0.016	0.001	0.015	0.003	0.016	0.013	0.016	0.000
7440-47-3	24	Cr	0.014	0.001	0.017	0.005	0.015	0.014	0.015	0.000
7439-96-5	25	Mn	0.009	0.004	0.015	0.003	0.010	0.013	0.010	0.000
7439-89-6	26	Fe	0.290	0.020	0.400	0.060	0.313	0.104	0.313	0.000
7440-02-0	28	Ni	0.040	0.008	0.070	0.020	0.046	0.034	0.046	0.000
7440-50-8	29	Cu	3.000	0.260	2.400	0.200	2.876	0.590	2.876	0.000
7440-66-6	30	Zn	4.200	1.400	4.000	1.400	4.159	2.065	4.159	0.000
7440-38-2	33	As	24.000	2.600	38.000	9.000	26.893	10.474	26.893	0.000
7782-49-2	34	Se	0.000	0.100	0.000	0.200	0.000	0.220	0.000	0.000
7726-95-6	35	Br	0.000	0.300	0.000	1.000	0.000	1.027	0.000	0.000
7440-17-7	37	Rb	0.000	0.100	0.000	0.100	0.000	0.138	0.000	0.000
7440-24-6	38	Sr	0.000	0.100	0.000	0.100	0.000	0.138	0.000	0.000
7440-65-5	39	Y	0.000	0.100	0.000	0.100	0.000	0.138	0.000	0.000
7439-98-7	42	Mo	0.100	0.012	0.134	0.035	0.107	0.054	0.107	0.000
7440-22-4	47	Ag	0.120	0.015	0.120	0.050	0.120	0.065	0.120	0.000
7440-43-9	48	Cd	0.510	0.150	0.460	0.080	0.500	0.196	0.500	0.000
7440-74-6	49	In	0.023	0.005	0.000	0.020	0.018	0.021	0.018	0.000
7440-31-5	50	Sn	0.400	0.063	0.390	0.070	0.398	0.129	0.398	0.000
7440-36-0	51	Sb	6.000	0.580	5.600	0.400	5.917	1.223	5.917	0.000
13494-80-9	52	Te	0.170	0.025	0.180	0.030	0.172	0.063	0.172	0.000
7439-97-6	80	Hg	0.000	0.200	0.000	0.500	0.000	0.529	0.000	0.000
7439-92-1	82	Pb	18.000	0.930	16.000	2.000	17.587	3.654	17.587	0.000
7440-69-9	83	Bi	0.400	0.082	NR	0.000	0.317	0.097	0.317	0.000
TOTALS:			57.292		67.801		59.464		59.464	

(1) No controlled specified: thus, assumed uncontrolled.
(2) Estimated / extrapolated.

```
PM Profile Speciation Report
-------------------------------------------------------------------------------
Profile Name   : Primary Copper Roaster
Profile Number : 29209
Data Quality   : D
-------------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1,18
Data Source    : Data taken from Reference 1. For details, consult Reference
                 18.

SCC Assignments: 30300502, 30300509

Mass Fraction Data -  Size Interval (um) :     (0-2.5)         (0-6)          (0-10)
                      Mass Fraction      :      0.970          1.000           1.000
-------------------------------------------------------------------------------
Total Particulate Matter -
                                                                         Total
                               0-2.5 um      2.5-10 um      0-10 um     Measured(2)
                Species      ------------   ------------  ------------  ------------
CAS Number   Num   Sym        %wt    unc     %wt    unc    %wt    unc    %wt    unc
-------------------------------------------------------------------------------
  7429-90-5   13   Al        6.300  0.600   2.400  0.200   2.621  1.096   2.621  0.000
  7440-21-3   14   Si       13.500  1.200   4.800  0.500   5.293  2.300   5.293  0.000
  7704-34-9   16   S         9.800  0.900   8.100  0.300   8.196  1.830   8.196  0.000
  7782-50-5   17   Cl        0.000  0.100   0.000  0.100   0.000  0.138   0.000  0.000
  7440-09-7   19   K         1.010  0.100   0.420  0.080   0.453  0.201   0.453  0.000
  7440-70-2   20   Ca        2.000  0.170   1.620  0.110   1.642  0.393   1.642  0.000
  7440-32-6   22   Ti        0.260  0.050   0.160  0.040   0.166  0.083   0.166  0.000
  7440-62-2   23   V         0.000  0.050   0.000  0.040   0.000  0.062   0.000  0.000
  7440-47-3   24   Cr        0.066  0.015   0.040  0.020   0.042  0.033   0.042  0.000
  7439-96-5   25   Mn        0.137  0.015   0.081  0.018   0.084  0.041   0.084  0.000
  7439-89-6   26   Fe       18.600  1.500  13.000  0.600  13.317  3.269  13.317  0.000
  7440-02-0   28   Ni        0.110  0.050   0.000  0.080   0.006  0.094   0.006  0.000
  7440-50-8   29   Cu       18.600  1.500  18.400  1.900  18.411  3.935  18.411  0.000
  7440-66-6   30   Zn        1.090  0.120   1.020  0.080   1.024  0.248   1.024  0.000
  7440-38-2   33   As        4.200  0.400   3.700  0.600   3.728  0.998   3.728  0.000
  7782-49-2   34   Se        0.000  0.050   0.000  0.030   0.000  0.057   0.000  0.000
  7726-95-6   35   Br        0.000  0.300   0.000  0.200   0.000  0.351   0.000  0.000
  7440-17-7   37   Rb        0.000  0.040   0.000  0.050   0.000  0.063   0.000  0.000
  7440-24-6   38   Sr        0.050  0.020   0.000  0.040   0.003  0.044   0.003  0.000
  7440-65-5   39   Y         0.000  0.030   0.000  0.040   0.000  0.049   0.000  0.000
  7439-98-7   42   Mo        0.160  0.050   0.120  0.040   0.122  0.075   0.122  0.000
  7440-22-4   47   Ag        0.000  0.200   0.042  0.010   0.040  0.195   0.040  0.000
  7440-43-9   48   Cd        0.000  0.200   0.000  0.020   0.000  0.195   0.000  0.000
  7440-74-6   49   In        0.000  0.200   0.000  0.020   0.000  0.195   0.000  0.000
  7440-31-5   50   Sn        0.000  0.200   0.000  0.020   0.000  0.195   0.000  0.000
  7440-36-0   51   Sb        0.340  0.160   0.076  0.021   0.091  0.166   0.091  0.000
 13494-80-9   52   Te        0.000  0.200   0.000  0.100   0.000  0.218   0.000  0.000
  7439-97-6   80   Hg        0.000  0.100   0.000  0.040   0.000  0.105   0.000  0.000
  7439-92-1   82   Pb        2.130  0.180   1.750  0.100   1.772  0.413   1.772  0.000
  7440-69-9   83   Bi        0.300  0.100   0.060  0.030   0.074  0.112   0.074  0.000
-------------------------------------------------------------------------------
TOTALS:                     78.653         55.789         57.085         57.085
===============================================================================
(1)  No controlled specified: thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
```

```
PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Primary Copper Reverberatory Furnace Fugitives Composite
Profile Number : 29210
Data Quality   : D
--------------------------------------------------------------------------------
Control Device : Uncontrolled
Reference(s)   :
Data Source    : Profile represents a composite of Profiles 29203 and 29204,
                 fugitive emissions from reverb furnace slag tapping and
                 slag skimming.

SCC Assignments: 30300514

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.210         0.230           0.270
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                         Total
                               0-2.5 um       2.5-10 um      0-10 um     Measured
                 Species     ------------   ------------   ------------   ------------
CAS Number     Num   Sym     %wt   unc(1)   %wt   unc(1)   %wt   unc(1)   %wt   unc(1)
--------------------------------------------------------------------------------
 7429-90-5     13    Al      0.000  0.000   0.003  0.000   0.002  0.000   0.002  0.000
 7440-21-3     14    Si      0.000  0.000   3.593  0.000   0.233  0.000   0.233  0.000
 7704-34-9     16    S       0.050  0.000   0.000  0.000   0.047  0.000   0.047  0.000
 7782-50-5     17    Cl      0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
 7440-09-7     19    K       0.361  0.000   0.435  0.000   0.366  0.000   0.366  0.000
 7440-70-2     20    Ca      0.000  0.000   0.123  0.000   0.008  0.000   0.008  0.000
 7440-32-6     22    Ti      0.010  0.000   0.059  0.000   0.013  0.000   0.013  0.000
 7440-62-2     23    V       0.003  0.000   0.175  0.000   0.014  0.000   0.014  0.000
 7440-47-3     24    Cr      0.000  0.000   0.085  0.000   0.006  0.000   0.006  0.000
 7439-96-5     25    Mn      0.010  0.000   0.020  0.000   0.010  0.000   0.010  0.000
 7439-89-6     26    Fe      0.427  0.000   3.391  0.000   0.625  0.000   0.625  0.000
 7440-02-0     28    Ni      0.000  0.000   0.115  0.000   0.008  0.000   0.008  0.000
 7440-50-8     29    Cu      0.172  0.000   3.481  0.000   0.387  0.000   0.387  0.000
 7440-66-6     30    Zn     13.078  0.000   7.050  0.000  12.658  0.000  12.658  0.000
 7440-38-2     33    As     37.863  0.000  41.366  0.000  38.445  0.000  38.445  0.000
 7782-49-2     34    Se      0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
 7726-95-6     35    Br      0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
 7440-17-7     37    Rb      0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
 7440-24-6     38    Sr      0.004  0.000   0.001  0.000   0.004  0.000   0.004  0.000
 7440-65-5     39    Y       0.021  0.000   0.007  0.000   0.020  0.000   0.020  0.000
 7439-98-7     42    Mo      0.230  0.000   0.244  0.000   0.232  0.000   0.232  0.000
 7440-22-4     47    Ag      0.006  0.000   0.002  0.000   0.005  0.000   0.005  0.000
 7440-43-9     48    Cd      1.235  0.000   0.788  0.000   1.203  0.000   1.203  0.000
 7440-74-6     49    In      0.037  0.000   0.042  0.000   0.036  0.000   0.036  0.000
 7440-31-5     50    Sn      0.426  0.000   0.308  0.000   0.421  0.000   0.421  0.000
 7440-36-0     51    Sb      1.374  0.000   1.033  0.000   1.349  0.000   1.349  0.000
 7439-97-6     80    Hg      0.000  0.000   0.000  0.000   0.000  0.000   0.000  0.000
 7439-92-1     82    Pb     13.976  0.000  10.882  0.000  13.840  0.000  13.840  0.000
--------------------------------------------------------------------------------
TOTALS:                     69.283         73.203         69.932         69.932
================================================================================
(1)  Uncertainty not evaluated.
```

```
PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Primary Copper Converter - Secondary Hood Composite
Profile Number : 29211
Data Quality   : D
--------------------------------------------------------------------------------
Control Device : Uncontrolled
Reference(s)   :
Data Source    : Profile represents a composite of Profiles 29205 and 29206.

SCC Assignments: 30300515

Mass Fraction Data -  Size Interval (um) :    (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :     0.120         0.320           0.590
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                      Total
                                 0-2.5 um      2.5-10 um     0-10 um      Measured
                    Species    -----------   -----------  -----------  -----------
 CAS Number   Num   Sym       %wt  unc(1)   %wt  unc(1)   %wt  unc(1)   %wt  unc(1)
--------------------------------------------------------------------------------
  7429-90-5   13    Al       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-21-3   14    Si       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7704-34-9   16    S        0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7782-50-5   17    Cl       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-09-7   19    K        0.067  0.000  0.155  0.000  0.073  0.000  0.073  0.000
  7440-70-2   20    Ca       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-32-6   22    Ti       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-62-2   23    V        0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-47-3   24    Cr       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7439-96-5   25    Mn       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7439-89-6   26    Fe       0.150  0.000  3.692  0.000  0.584  0.000  0.584  0.000
  7440-02-0   28    Ni       0.004  0.000  0.005  0.000  0.004  0.000  0.004  0.000
  7440-50-8   29    Cu       0.800  0.000  5.362  0.000  1.344  0.000  1.344  0.000
  7440-66-6   30    Zn       4.925  0.000  4.273  0.000  4.805  0.000  4.805  0.000
  7440-38-2   33    As      16.615  0.000  5.267  0.000 15.099  0.000 15.099  0.000
  7782-49-2   34    Se       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7726-95-6   35    Br       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-17-7   37    Rb       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-24-6   38    Sr       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-65-5   39    Y        0.019  0.000  0.032  0.000  0.020  0.000  0.020  0.000
  7439-98-7   42    Mo       0.030  0.000  0.048  0.000  0.027  0.000  0.027  0.000
  7440-22-4   47    Ag       0.155  0.000  0.097  0.000  0.149  0.000  0.149  0.000
  7440-43-9   48    Cd       0.616  0.000  0.543  0.000  0.601  0.000  0.601  0.000
  7440-74-6   49    In       0.088  0.000  0.024  0.000  0.080  0.000  0.080  0.000
  7440-31-5   50    Sn       0.418  0.000  0.433  0.000  0.415  0.000  0.415  0.000
  7440-36-0   51    Sb       2.104  0.000  1.654  0.000  2.033  0.000  2.033  0.000
  7439-97-6   80    Hg       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7439-92-1   82    Pb      25.779  0.000 14.498  0.000 24.207  0.000 24.207  0.000
--------------------------------------------------------------------------------
TOTALS:                     51.770        36.083        49.441        49.441
================================================================================
(1)  Uncertainty not evaluated.
```

PM Profile Speciation Report

Profile Name : Primary Lead - Dross Building
Profile Number : 29310
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,14
Data Source : Data taken from Reference 1. For details, consult Reference 14.

SCC Assignments: 30301009

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.830	0.930	0.980

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.000	0.078	0.000	0.111	0.000	0.000	0.000	0.064
7440-21-3	14	Si	0.000	0.024	0.000	0.056	0.000	0.000	0.000	0.024
7723-14-0	15	P	0.000	0.016	0.000	0.023	0.000	0.000	0.000	0.013
7704-34-9	16	S	0.000	0.416	0.000	0.635	0.000	0.000	0.000	0.348
7782-50-5	17	Cl	0.000	0.147	0.000	0.130	0.000	0.000	0.000	0.110
7440-09-7	19	K	0.000	0.040	0.000	0.045	0.000	0.000	0.000	0.031
7440-70-2	20	Ca	0.000	0.080	0.000	0.113	0.000	0.000	0.000	0.065
7440-32-6	22	Ti	0.000	0.008	0.000	0.011	0.000	0.000	0.000	0.007
7440-62-2	23	V	0.000	0.002	0.005	0.021	0.001	0.000	0.002	0.007
7440-47-3	24	Cr	0.003	0.008	0.000	0.003	0.003	0.000	0.002	0.006
7439-96-5	25	Mn	0.000	0.003	0.000	0.006	0.000	0.000	0.000	0.003
7439-89-6	26	Fe	0.482	0.634	1.431	0.820	0.627	0.000	0.770	0.511
7440-02-0	28	Ni	0.023	0.042	0.073	0.102	0.031	0.000	0.038	0.043
7440-50-8	29	Cu	0.179	0.052	1.889	0.457	0.441	0.000	0.697	0.152
7440-66-6	30	Zn	0.745	0.200	0.672	0.235	0.734	0.000	0.723	0.172
7440-55-3	31	Ga	0.027	0.092	0.035	0.146	0.028	0.000	0.030	0.078
7440-38-2	33	As	58.289	9.831	6.755	5.152	50.401	0.000	42.673	8.645
7782-49-2	34	Se	0.000	0.016	0.000	0.028	0.000	0.000	0.000	0.014
7726-95-6	35	Br	0.000	0.194	0.000	0.065	0.000	0.000	0.000	0.137
7440-17-7	37	Rb	0.000	0.042	0.000	0.016	0.000	0.000	0.000	0.030
7440-24-6	38	Sr	0.007	0.012	0.016	0.055	0.008	0.000	0.010	0.019
7440-65-5	39	Y	0.026	0.088	0.000	0.039	0.022	0.000	0.018	0.063
7440-67-7	40	Zr	0.018	0.009	0.039	0.128	0.021	0.000	0.024	0.039
7439-98-7	42	Mo	0.051	0.026	0.033	0.089	0.048	0.000	0.046	0.033
7440-05-3	46	Pd	0.000	0.002	0.017	0.056	0.003	0.000	0.005	0.017
7440-22-4	47	Ag	0.081	0.075	0.290	0.155	0.113	0.000	0.144	0.071
7440-43-9	48	Cd	0.548	0.297	0.133	0.235	0.484	0.000	0.422	0.224
7440-74-6	49	In	0.028	0.084	0.047	0.190	0.031	0.000	0.034	0.082
7440-31-5	50	Sn	0.233	0.400	0.842	0.320	0.326	0.000	0.418	0.297
7440-36-0	51	Sb	5.871	4.088	1.077	0.855	5.137	0.000	4.418	2.906
7440-39-3	56	Ba	0.065	0.060	0.000	0.028	0.055	0.000	0.045	0.043
7439-91-0	57	La	0.122	0.141	0.000	0.028	0.103	0.000	0.085	0.099
7439-97-6	80	Hg	0.000	0.024	0.040	0.155	0.006	0.000	0.012	0.050
7439-92-1	82	Pb	13.256	9.693	15.791	5.847	13.644	0.000	14.024	7.113
TOTALS:			80.054		29.185		72.267		64.640	

(1) No controlled specified: thus, assumed uncontrolled.
(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Primary Lead - Slag Pour
Profile Number : 29311
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 1,14
Data Source : Data taken from Reference 1. For details, consult Reference 14.

SCC Assignments: 30301021

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.730	0.830	0.890

Total Particulate Matter -

	Species		0-2.5 um(2)		2.5-10 um(2)		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023
7440-21-3	14	Si	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
7723-14-0	15	P	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
7704-34-9	16	S	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.506
7782-50-5	17	Cl	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.311
7440-09-7	19	K	0.959	0.000	0.959	0.000	0.959	0.000	0.959	0.557
7440-70-2	20	Ca	0.091	0.000	0.091	0.000	0.091	0.000	0.091	0.104
7440-32-6	22	Ti	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
7440-62-2	23	V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
7440-47-3	24	Cr	0.043	0.000	0.043	0.000	0.043	0.000	0.043	0.082
7439-96-5	25	Mn	0.044	0.000	0.044	0.000	0.044	0.000	0.044	0.081
7439-89-6	26	Fe	0.319	0.000	0.319	0.000	0.319	0.000	0.319	0.039
7440-02-0	28	Ni	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010
7440-50-8	29	Cu	0.084	0.000	0.084	0.000	0.084	0.000	0.084	0.181
7440-66-6	30	Zn	48.556	0.000	48.556	0.000	48.556	0.000	48.556	11.856
7440-55-3	31	Ga	0.034	0.000	0.034	0.000	0.034	0.000	0.034	0.123
7440-38-2	33	As	0.060	0.000	0.060	0.000	0.060	0.000	0.060	1.626
7782-49-2	34	Se	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
7726-95-6	35	Br	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
7440-17-7	37	Rb	0.021	0.000	0.021	0.000	0.021	0.000	0.021	0.125
7440-24-6	38	Sr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010
7440-65-5	39	Y	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.079
7440-67-7	40	Zr	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.034
7439-98-7	42	Mo	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
7440-05-3	46	Pd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023
7440-22-4	47	Ag	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023
7440-74-6	49	In	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.062
7440-31-5	50	Sn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.045
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023
7440-39-3	56	Ba	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.045
7439-91-0	57	La	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.045
7439-97-6	80	Hg	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.042
7439-92-1	82	Pb	27.417	0.000	27.417	0.000	27.417	0.000	27.417	2.821
TOTALS:			77.671		77.671		77.671		77.671	

(1) No control specified: thus, assumed uncontrolled.
(2) Estimated / extrapolated.

3.4 SECONDARY METAL PRODUCTION

Secondary metal production is the production of metals from scrap material. Processes generating particulate emissions can include smelting, pouring into molds, cleaning, refining, alloying, and storage and handling.

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PM Profile Speciation Report

Profile Name : Secondary Aluminum - Dross Recovery Furnace
Profile Number : 20103
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,2
Data Source : Data taken from Reference 1. For details, consult Reference 2.

SCC Assignments: 30400107

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.820	0.890	0.920

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	15.500	1.600	18.000	4.400	15.772	5.081	15.972	2.374
7429-90-5	13	Al	1.700	0.200	4.700	0.800	2.026	0.926	2.266	0.319
7440-21-3	14	Si	3.100	2.200	7.600	3.700	3.589	4.088	3.949	1.959
7723-14-0	15	P	0.450	0.270	0.370	0.110	0.441	0.275	0.435	0.226
7704-34-9	16	S	3.000	4.000	2.000	0.200	2.891	3.597	2.811	3.263
7782-50-5	17	Cl	20.000	4.000	21.000	5.000	20.109	6.709	20.189	4.091
7440-09-7	19	K	10.900	1.500	6.300	4.500	10.400	4.700	10.032	1.910
7440-70-2	20	Ca	0.120	0.090	0.870	0.260	0.202	0.282	0.262	0.091
7440-22-2	21	Sc	NR	0.000	0.000	0.000	NE	0.000	0.000	0.000
7440-32-6	22	Ti	0.024	0.003	0.120	0.040	0.034	0.049	0.042	0.009
7440-62-2	23	V	0.004	0.001	0.006	0.004	0.004	0.008	0.004	0.001
7440-47-3	24	Cr	0.039	0.004	0.061	0.007	0.041	0.024	0.043	0.006
7439-96-5	25	Mn	0.012	0.001	0.029	0.011	0.014	0.018	0.015	0.003
7439-89-6	26	Fe	0.290	0.090	1.200	0.200	0.389	0.252	0.462	0.093
7440-48-4	27	Co	0.001	0.000	0.006	0.001	0.002	0.006	0.002	0.000
7440-02-0	28	Ni	0.033	0.003	0.056	0.029	0.036	0.035	0.037	0.007
7440-50-8	29	Cu	0.045	0.020	0.110	0.030	0.052	0.045	0.057	0.018
7440-66-6	30	Zn	0.075	0.008	0.190	0.020	0.088	0.047	0.097	0.012
7440-38-2	33	As	0.002	0.001	0.002	0.001	0.002	0.004	0.002	0.001
7782-49-2	34	Se	0.006	0.001	0.009	0.001	0.007	0.008	0.007	0.001
7726-95-6	35	Br	0.063	0.007	0.039	0.008	0.060	0.021	0.059	0.009
7440-17-7	37	Rb	0.009	0.004	NR	0.000	NE	0.000	0.008	0.003
7440-22-4	47	Ag	NR	0.000	0.008	0.001	NE	0.000	0.002	0.000
7440-31-5	50	Sn	0.055	0.054	NR	0.000	NE	0.000	0.045	0.044
7440-36-0	51	Sb	0.570	0.060	NR	0.000	NE	0.000	0.463	0.077
7439-91-0	57	La	0.002	0.001	NR	0.000	NE	0.000	0.001	0.000
7440-45-1	58	Ce	NR	0.000	0.002	0.001	NE	0.000	0.000	0.000
7439-92-1	82	Pb	0.081	0.014	0.098	0.031	0.083	0.044	0.084	0.016
7440-29-1	90	Th	NR	0.000	0.000	0.000	NE	0.000	0.000	0.000
	201	OC	1.500	1.400	43.000	33.000	6.011	31.420	9.330	6.375
	202	EC	0.190	0.070	4.000	1.400	0.604	1.381	0.909	0.281
	203	SO4	0.400	0.360	NR	0.000	NE	0.000	0.325	0.295
	204	NO3	2.200	0.900	NR	0.000	NE	0.000	1.785	0.766
TOTALS:			60.371		109.776		62.857		69.695	

(1) No control specified: thus, assumed uncontrolled.
(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

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PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Seconary Lead - Sanitary Baghouse
Profile Number : 20402
Data Quality   : E
--------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1,15
Data Source    : Data taken from Reference 1. For details, consult Reference
                 15.

SCC Assignments: 30400499

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.650         0.780           0.840
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                      Total
                           0-2.5 um(1)   2.5-10 um(1)   0-10 um(1)   Measured
               Species     -----------   -----------   -----------  -----------
 CAS Number   Num  Sym      %wt    unc    %wt    unc    %wt    unc   %wt    unc
--------------------------------------------------------------------------------

  7440-23-5   11   Na      0.120  0.000  0.120  0.000  0.120  0.000  0.120  0.024
  7439-95-4   12   Mg      0.015  0.000  0.015  0.000  0.015  0.000  0.015  0.015
  7429-90-5   13   Al      0.150  0.000  0.150  0.000  0.150  0.000  0.150  0.030
  7440-21-3   14   Si      0.072  0.000  0.072  0.000  0.072  0.000  0.072  0.014
  7723-14-0   15   P       0.010  0.000  0.010  0.000  0.010  0.000  0.010  0.010
  7782-50-5   17   Cl      0.380  0.000  0.380  0.000  0.380  0.000  0.380  0.076
  7440-09-7   19   K       0.390  0.000  0.390  0.000  0.390  0.000  0.390  0.120
  7440-70-2   20   Ca      0.039  0.000  0.039  0.000  0.039  0.000  0.039  0.020
  7440-32-6   22   Ti      0.011  0.000  0.011  0.000  0.011  0.000  0.011  0.008
  7440-62-2   23   V       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-47-3   24   Cr      0.015  0.000  0.015  0.000  0.015  0.000  0.015  0.003
  7439-96-5   25   Mn      0.031  0.000  0.031  0.000  0.031  0.000  0.031  0.006
  7439-89-6   26   Fe      4.320  0.000  4.320  0.000  4.320  0.000  4.320  0.864
  7440-48-4   27   Co      0.002  0.000  0.002  0.000  0.002  0.000  0.002  0.001
  7440-02-0   28   Ni      0.021  0.000  0.021  0.000  0.021  0.000  0.021  0.004
  7440-50-8   29   Cu      0.120  0.000  0.120  0.000  0.120  0.000  0.120  0.024
  7440-66-6   30   Zn      0.032  0.000  0.032  0.000  0.032  0.000  0.032  0.013
  7440-38-2   33   As      0.035  0.000  0.035  0.000  0.035  0.000  0.035  0.012
  7782-49-2   34   Se      0.005  0.000  0.005  0.000  0.005  0.000  0.005  0.002
  7726-95-6   35   Br      0.004  0.000  0.004  0.000  0.004  0.000  0.004  0.001
  7440-17-7   37   Rb      0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.001
  7440-24-6   38   Sr      0.004  0.000  0.004  0.000  0.004  0.000  0.004  0.003
  7440-05-3   46   Pd      0.014  0.000  0.014  0.000  0.014  0.000  0.014  0.014
  7440-22-4   47   Ag      0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.001
  7440-43-9   48   Cd      0.010  0.000  0.010  0.000  0.010  0.000  0.010  0.010
  7440-74-6   49   In      0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.000
  7440-31-5   50   Sn      0.106  0.000  0.106  0.000  0.106  0.000  0.106  0.106
  7440-36-0   51   Sb      0.840  0.000  0.840  0.000  0.840  0.000  0.840  0.168
  7440-39-3   56   Ba      0.035  0.000  0.035  0.000  0.035  0.000  0.035  0.035
  7439-97-6   80   Hg      0.003  0.000  0.003  0.000  0.003  0.000  0.003  0.005
  7439-92-1   82   Pb     11.500  0.000 11.500  0.000 11.500  0.000 11.500  1.200
--------------------------------------------------------------------------------
TOTALS:                   18.286        18.286        18.286        18.286
================================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Seconary Lead - Reverberatory Furnace
Profile Number : 20403
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 1,15
Data Source : Data taken from Reference 1. For details, consult Reference 15.

SCC Assignments: 30400402

Mass Fraction Data -				
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.350	0.390	0.400

Total Particulate Matter -

	Species		0-2.5 um(2)		2.5-10 um(2)		0-10 um(3)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc(3)
7440-23-5	11	Na	1.043	0.000	1.043	0.000	1.043	0.000	1.043	0.209
7439-95-4	12	Mg	0.054	0.000	0.054	0.000	0.054	0.000	0.054	0.054
7429-90-5	13	Al	0.323	0.000	0.323	0.000	0.323	0.000	0.323	0.065
7440-21-3	14	Si	0.398	0.000	0.398	0.000	0.398	0.000	0.398	0.080
7723-14-0	15	P	0.215	0.000	0.215	0.000	0.215	0.000	0.215	0.215
7704-34-9	16	S	2.118	0.000	2.118	0.000	2.118	0.000	2.118	0.422
7782-50-5	17	Cl	1.312	0.000	1.312	0.000	1.312	0.000	1.312	0.262
7440-09-7	19	K	0.301	0.000	0.301	0.000	0.301	0.000	0.301	0.065
7440-70-2	20	Ca	0.688	0.000	0.688	0.000	0.688	0.000	0.688	0.138
7440-32-6	22	Ti	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.005
7440-62-2	23	V	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.001
7440-47-3	24	Cr	0.118	0.000	0.118	0.000	0.118	0.000	0.118	0.032
7439-96-5	25	Mn	0.033	0.000	0.033	0.000	0.033	0.000	0.033	0.007
7439-89-6	26	Fe	0.946	0.000	0.946	0.000	0.946	0.000	0.946	0.189
7440-48-4	27	Co	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.002
7440-02-0	28	Ni	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.022
7440-50-8	29	Cu	0.269	0.000	0.269	0.000	0.269	0.000	0.269	0.054
7440-66-6	30	Zn	0.172	0.000	0.172	0.000	0.172	0.000	0.172	0.034
7440-38-2	33	As	0.355	0.000	0.355	0.000	0.355	0.000	0.355	0.071
7782-49-2	34	Se	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.013
7726-95-6	35	Br	0.290	0.000	0.290	0.000	0.290	0.000	0.290	0.058
7440-17-7	37	Rb	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.043
7440-24-6	38	Sr	0.027	0.000	0.027	0.000	0.027	0.000	0.027	0.027
7440-05-3	46	Pd	0.280	0.000	0.280	0.000	0.280	0.000	0.280	0.151
7440-22-4	47	Ag	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.022
7440-43-9	48	Cd	0.645	0.000	0.645	0.000	0.645	0.000	0.645	0.430
7440-74-6	49	In	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-31-5	50	Sn	0.065	0.000	0.065	0.000	0.065	0.000	0.065	0.409
7440-36-0	51	Sb	1.893	0.000	1.893	0.000	1.893	0.000	1.893	0.379
7440-39-3	56	Ba	0.807	0.000	0.807	0.000	0.807	0.000	0.807	0.807
7439-97-6	80	Hg	0.108	0.000	0.108	0.000	0.108	0.000	0.108	0.043
7439-92-1	82	Pb	11.400	0.000	11.400	0.000	11.400	0.000	11.400	1.183
TOTALS:			23.988		23.988		23.988		23.988	

(1) No control specified: thus, assumed uncontrolled.
(2) Estamated / extrapolated.
(3) Estimated / extrapolated.

```
PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Seconary Lead - Melting Pot Fugitives
Profile Number : 20404
Data Quality   : E
------------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1,15
Data Source    : Data taken from Reference 1. For details, consult Reference
                 15.

SCC Assignments: 30400413

Mass Fraction Data -  Size Interval (um) :     (0-2.5)       (0-6)        (0-10)
                      Mass Fraction      :      0.650        0.780         0.840
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                      Total
                          0-2.5 um(2)   2.5-10 um(2)   0-10 um(3)    Measured
              Species    ------------   ------------  ------------  ------------
CAS Number   Num  Sym     %wt    unc     %wt    unc    %wt    unc    %wt  unc(3)
------------------------------------------------------------------------------
 7440-23-5   11   Na     0.559  0.000   0.559  0.000  0.559  0.000  0.559  0.112
 7439-95-4   12   Mg     0.353  0.000   0.353  0.000  0.353  0.000  0.353  0.077
 7429-90-5   13   Al     1.529  0.000   1.529  0.000  1.529  0.000  1.529  0.306
 7440-21-3   14   Si     1.412  0.000   1.412  0.000  1.412  0.000  1.412  0.282
 7723-14-0   15   P      0.112  0.000   0.112  0.000  0.112  0.000  0.112  0.112
 7704-34-9   16   S      0.230  0.000   0.230  0.000  0.230  0.000  0.230  0.230
 7782-50-5   17   Cl     0.506  0.000   0.506  0.000  0.506  0.000  0.506  0.101
 7440-09-7   19   K      0.065  0.000   0.065  0.000  0.065  0.000  0.065  0.029
 7440-70-2   20   Ca     0.218  0.000   0.218  0.000  0.218  0.000  0.218  0.047
 7440-32-6   22   Ti     0.039  0.000   0.039  0.000  0.039  0.000  0.039  0.014
 7440-62-2   23   V      0.002  0.000   0.002  0.000  0.002  0.000  0.002  0.001
 7440-47-3   24   Cr     0.006  0.000   0.006  0.000  0.006  0.000  0.006  0.012
 7439-96-5   25   Mn     0.010  0.000   0.010  0.000  0.010  0.000  0.010  0.002
 7439-89-6   26   Fe     0.329  0.000   0.329  0.000  0.329  0.000  0.329  0.066
 7440-48-4   27   Co     0.001  0.000   0.001  0.000  0.001  0.000  0.001  0.001
 7440-02-0   28   Ni     0.018  0.000   0.018  0.000  0.018  0.000  0.018  0.012
 7440-50-8   29   Cu     0.129  0.000   0.129  0.000  0.129  0.000  0.129  0.026
 7440-66-6   30   Zn     0.055  0.000   0.055  0.000  0.055  0.000  0.055  0.011
 7440-38-2   33   As     0.212  0.000   0.212  0.000  0.212  0.000  0.212  0.042
 7782-49-2   34   Se     0.003  0.000   0.003  0.000  0.003  0.000  0.003  0.003
 7726-95-6   35   Br     0.007  0.000   0.007  0.000  0.007  0.000  0.007  0.001
 7440-17-7   37   Rb     0.012  0.000   0.012  0.000  0.012  0.000  0.012  0.012
 7440-24-6   38   Sr     0.012  0.000   0.012  0.000  0.012  0.000  0.012  0.012
 7440-05-3   46   Pd     0.088  0.000   0.088  0.000  0.088  0.000  0.088  0.071
 7440-22-4   47   Ag     0.001  0.000   0.001  0.000  0.001  0.000  0.001  0.001
 7440-43-9   48   Cd     0.035  0.000   0.035  0.000  0.035  0.000  0.035  0.029
 7440-74-6   49   In     0.001  0.000   0.001  0.000  0.001  0.000  0.001  0.001
 7440-31-5   50   Sn     0.171  0.000   0.171  0.000  0.171  0.000  0.171  0.171
 7440-36-0   51   Sb     1.294  0.000   1.294  0.000  1.294  0.000  1.294  0.259
 7440-39-3   56   Ba     0.588  0.000   0.588  0.000  0.588  0.000  0.588  0.588
 7439-97-6   80   Hg     0.024  0.000   0.024  0.000  0.024  0.000  0.024  0.024
 7439-92-1   82   Pb    10.000  0.000  10.000  0.000 10.000  0.000 10.000  1.177
------------------------------------------------------------------------------
TOTALS:                 18.021         18.021         18.021        18.021
==============================================================================
(1)  No control specified: thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
(3)  Estimated / extrapolated.
```

```
PM Profile Speciation Report
----------------------------------------------------------------------------
Profile Name   : Seconary Lead - Melting Pot Stack
Profile Number : 20405
Data Quality   : E
----------------------------------------------------------------------------
Control Device : Baghouse
Reference(s)   : 1,15
Data Source    : Data taken from Reference 1. For details, consult Reference
                 15.

SCC Assignments: 30400401

Mass Fraction Data -  Size Interval (um) :     (0-2.5)       (0-6)         (0-10)
                      Mass Fraction      :      0.710        0.840          0.890
----------------------------------------------------------------------------
Total Particulate Matter -
                                                                      Total
                           0-2.5 um(1)   2.5-10 um(1)   0-10 um(1)   Measured
               Species     -----------   ------------   -----------  -----------
 CAS Number   Num  Sym     %wt    unc    %wt    unc     %wt    unc   %wt    unc
----------------------------------------------------------------------------
  7440-23-5   11   Na     0.205  0.000  0.205  0.000  0.205  0.000  0.205  0.041
  7439-95-4   12   Mg     0.063  0.000  0.063  0.000  0.063  0.000  0.063  0.027
  7429-90-5   13   Al     0.243  0.000  0.243  0.000  0.243  0.000  0.243  0.049
  7440-21-3   14   Si     0.234  0.000  0.234  0.000  0.234  0.000  0.234  0.047
  7723-14-0   15   P      0.097  0.000  0.097  0.000  0.097  0.000  0.097  0.097
  7704-34-9   16   S      0.167  0.000  0.167  0.000  0.167  0.000  0.167  0.167
  7782-50-5   17   Cl     0.365  0.000  0.365  0.000  0.365  0.000  0.365  0.073
  7440-09-7   19   K      0.083  0.000  0.083  0.000  0.083  0.000  0.083  0.017
  7440-70-2   20   Ca     0.039  0.000  0.039  0.000  0.039  0.000  0.039  0.020
  7440-32-6   22   Ti     0.017  0.000  0.017  0.000  0.017  0.000  0.017  0.006
  7440-62-2   23   V      0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-47-3   24   Cr     0.007  0.000  0.007  0.000  0.007  0.000  0.007  0.005
  7439-96-5   25   Mn     0.002  0.000  0.002  0.000  0.002  0.000  0.002  0.000
  7439-89-6   26   Fe     0.175  0.000  0.175  0.000  0.175  0.000  0.175  0.035
  7440-48-4   27   Co     0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-02-0   28   Ni     0.019  0.000  0.019  0.000  0.019  0.000  0.019  0.006
  7440-50-8   29   Cu     0.020  0.000  0.020  0.000  0.020  0.000  0.020  0.005
  7440-66-6   30   Zn     0.034  0.000  0.034  0.000  0.034  0.000  0.034  0.007
  7440-38-2   33   As     0.036  0.000  0.036  0.000  0.036  0.000  0.036  0.007
  7782-49-2   34   Se     0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.001
  7726-95-6   35   Br     0.032  0.000  0.032  0.000  0.032  0.000  0.032  0.006
  7440-17-7   37   Rb     0.005  0.000  0.005  0.000  0.005  0.000  0.005  0.005
  7440-24-6   38   Sr     0.005  0.000  0.005  0.000  0.005  0.000  0.005  0.005
  7440-05-3   46   Pd     0.010  0.000  0.010  0.000  0.010  0.000  0.010  0.034
  7440-22-4   47   Ag     0.001  0.000  0.001  0.000  0.001  0.000  0.001  0.001
  7440-43-9   48   Cd     0.004  0.000  0.004  0.000  0.004  0.000  0.004  0.004
  7440-74-6   49   In     0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7440-31-5   50   Sn     0.073  0.000  0.073  0.000  0.073  0.000  0.073  0.097
  7440-36-0   51   Sb     0.080  0.000  0.080  0.000  0.080  0.000  0.080  0.016
  7440-39-3   56   Ba     0.122  0.000  0.122  0.000  0.122  0.000  0.122  0.122
  7439-97-6   80   Hg     0.020  0.000  0.020  0.000  0.020  0.000  0.020  0.015
  7439-92-1   82   Pb    11.100  0.000 11.100  0.000 11.100  0.000 11.100  1.120
----------------------------------------------------------------------------
TOTALS:                  13.259        13.259        13.259        13.259
============================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Seconary Lead - Yard Dust
Profile Number : 20406
Data Quality : E

Control Device : Not Applicable
Reference(s) : 1,16
Data Source : Data taken from Reference 1. For details, consult Reference 16.

SCC Assignments: 30400499

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.350	0.390	0.400

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um(1)		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.420	0.084	0.533	0.000	0.434	0.000	0.533	0.091
7429-90-5	13	Al	1.866	0.373	1.466	0.000	1.816	0.000	1.466	0.229
7440-21-3	14	Si	2.971	0.549	2.367	0.000	2.896	0.000	2.367	0.370
7723-14-0	15	P	0.909	0.183	0.681	0.000	0.880	0.000	0.681	0.105
7782-50-5	17	Cl	0.610	0.120	0.872	0.000	0.643	0.000	0.872	0.151
7440-09-7	19	K	0.406	0.018	0.500	0.000	0.418	0.000	0.500	0.085
7440-70-2	20	Ca	0.122	0.054	0.124	0.000	0.122	0.000	0.124	0.037
7440-32-6	22	Ti	0.041	0.008	0.009	0.000	0.037	0.000	0.009	0.002
7440-62-2	23	V	0.017	0.003	0.005	0.000	0.016	0.000	0.005	0.002
7440-47-3	24	Cr	0.021	0.004	0.023	0.000	0.021	0.000	0.023	0.004
7439-96-5	25	Mn	0.020	0.004	0.020	0.000	0.020	0.000	0.020	0.003
7439-89-6	26	Fe	0.458	0.092	0.408	0.000	0.452	0.000	0.408	0.065
7440-02-0	28	Ni	0.090	0.018	0.090	0.000	0.090	0.000	0.090	0.015
7440-50-8	29	Cu	0.151	0.030	0.156	0.000	0.152	0.000	0.156	0.026
7440-66-6	30	Zn	0.150	0.030	0.156	0.000	0.151	0.000	0.156	0.026
7440-55-3	31	Ga	0.042	0.042	0.041	0.000	0.041	0.000	0.041	0.034
7440-38-2	33	As	1.000	0.200	0.397	0.000	0.925	0.000	0.397	0.056
7782-49-2	34	Se	0.052	0.052	0.053	0.000	0.052	0.000	0.053	0.044
7726-95-6	35	Br	0.014	0.003	0.010	0.000	0.013	0.000	0.010	0.002
7440-17-7	37	Rb	0.008	0.008	0.008	0.000	0.008	0.000	0.008	0.006
7440-24-6	38	Sr	0.020	0.020	0.014	0.000	0.019	0.000	0.014	0.016
7440-65-5	39	Y	0.041	0.041	0.041	0.000	0.041	0.000	0.041	0.034
7440-67-7	40	Zr	0.063	0.063	0.063	0.000	0.063	0.000	0.063	0.052
7439-98-7	42	Mo	0.097	0.019	0.121	0.000	0.100	0.000	0.121	0.021
7440-05-3	46	Pd	0.044	0.044	0.163	0.000	0.059	0.000	0.163	0.154
7440-22-4	47	Ag	0.064	0.016	0.039	0.000	0.061	0.000	0.039	0.026
7440-43-9	48	Cd	0.650	0.620	0.527	0.000	0.635	0.000	0.527	0.411
7440-74-6	49	In	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-31-5	50	Sn	0.186	0.186	0.347	0.000	0.206	0.000	0.347	0.311
7440-36-0	51	Sb	2.600	0.520	1.055	0.000	2.407	0.000	1.055	0.149
7440-39-3	56	Ba	0.020	0.010	0.015	0.000	0.019	0.000	0.015	0.005
7439-91-0	57	La	0.088	0.088	0.046	0.000	0.083	0.000	0.046	0.033
7439-97-6	80	Hg	0.016	0.016	0.014	0.000	0.015	0.000	0.014	0.012
7439-92-1	82	Pb	66.630	6.663	68.091	0.000	66.813	0.000	68.091	6.809
TOTALS:			79.887		78.455		79.708		78.455	

(1) Estimated / extrapolated.
(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Antimony Oxide Plant - Antimony Roasting
Profile Number : 20503
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 1,2
Data Source : Data taken from Reference 1. For details, consult Reference 2.

SCC Assignments: 30400299

Mass Fraction Data -				
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.180	0.370	0.530

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured(3)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.030	0.053	0.330	0.500	0.228	0.000	0.228	0.000
7440-21-3	14	Si	NR	0.000	0.750	0.810	NE	0.000	NE	0.000
7704-34-9	16	S	1.280	0.070	1.300	0.100	1.293	0.000	1.293	0.000
7782-50-5	17	Cl	0.011	0.018	0.990	0.130	0.658	0.000	0.658	0.000
7440-32-6	22	Ti	NR	0.000	1.000	0.600	NE	0.000	NE	0.000
7440-62-2	23	V	0.001	0.000	0.002	0.003	0.001	0.000	0.001	0.000
7439-96-5	25	Mn	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.000
7440-02-0	28	Ni	0.014	0.001	0.012	0.003	0.013	0.000	0.013	0.000
7726-95-6	35	Br	0.022	0.001	0.028	0.001	0.026	0.000	0.026	0.000
7440-31-5	50	Sn	0.530	0.030	NR	0.000	NE	0.000	NE	0.000
7440-36-0	51	Sb	74.000	4.000	76.000	13.000	75.321	0.000	75.321	0.000
7439-92-1	82	Pb	0.170	0.040	0.110	0.020	0.130	0.000	0.130	0.000
	201	OC	1.000	0.600	4.800	1.600	3.509	0.000	3.509	0.000
	202	EC	0.099	0.014	0.230	0.280	0.186	0.000	0.186	0.000
	203	SO4	0.052	0.012	NR	0.000	NE	0.000	NE	0.000
TOTALS:			77.210		85.553		81.366		81.366	

(1) No control specified: thus, assumed uncontrolled.
(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.
(3) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Secondary Copper Pyrometal - Cathode Charge
Profile Number : 29501
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 1,14
Data Source : Data taken from Reference 1. For details, consult Reference 14.

SCC Assignments: 30400215

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.820	0.890	0.920

Total Particulate Matter -

	Species		0-2.5 um(2)		2.5-10 um(2)		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.076
7440-21-3	14	Si	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.152
7723-14-0	15	P	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030
7704-34-9	16	S	0.187	0.000	0.187	0.000	0.187	0.000	0.187	0.182
7782-50-5	17	Cl	0.373	0.000	0.373	0.000	0.373	0.000	0.373	0.075
7440-09-7	19	K	0.152	0.000	0.152	0.000	0.152	0.000	0.152	0.061
7440-70-2	20	Ca	0.273	0.000	0.273	0.000	0.273	0.000	0.273	0.076
7440-32-6	22	Ti	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
7440-62-2	23	V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
7440-47-3	24	Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
7439-96-5	25	Mn	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.002
7439-89-6	26	Fe	0.176	0.000	0.176	0.000	0.176	0.000	0.176	0.035
7440-02-0	28	Ni	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015
7440-50-8	29	Cu	15.435	0.000	15.435	0.000	15.435	0.000	15.435	3.087
7440-66-6	30	Zn	1.672	0.000	1.672	0.000	1.672	0.000	1.672	0.334
7440-55-3	31	Ga	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015
7440-38-2	33	As	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.142
7782-49-2	34	Se	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
7726-95-6	35	Br	0.037	0.000	0.037	0.000	0.037	0.000	0.037	0.007
7440-17-7	37	Rb	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.002
7440-24-6	38	Sr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
7440-65-5	39	Y	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010
7440-67-7	40	Zr	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.008
7439-98-7	42	Mo	0.046	0.000	0.046	0.000	0.046	0.000	0.046	0.015
7440-05-3	46	Pd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
7440-22-4	47	Ag	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030
7440-74-6	49	In	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015
7440-31-5	50	Sn	0.349	0.000	0.349	0.000	0.349	0.000	0.349	0.070
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015
7440-39-3	56	Ba	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.076
7439-91-0	57	La	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.122
7439-97-6	80	Hg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
7439-92-1	82	Pb	2.521	0.000	2.521	0.000	2.521	0.000	2.521	0.504
TOTALS:			21.248		21.248		21.248		21.248	

(1) No control specified: thus, assumed uncontrolled.
(2) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Secondary Copper Pyrometal - Regular Charge
Profile Number : 29502
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 1,14
Data Source : Data taken from Reference 1. For details, consult Reference 14.

SCC Assignments: 30400214

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.820	0.890	0.920

Total Particulate Matter -

	Species		0-2.5 um(2)		2.5-10 um(2)		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.191
7440-21-3	14	Si	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.511
7723-14-0	15	P	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.064
7704-34-9	16	S	0.348	0.000	0.348	0.000	0.348	0.000	0.348	0.579
7782-50-5	17	Cl	2.004	0.000	2.004	0.000	2.004	0.000	2.004	0.401
7440-09-7	19	K	0.320	0.000	0.320	0.000	0.320	0.000	0.320	0.064
7440-70-2	20	Ca	0.594	0.000	0.594	0.000	0.594	0.000	0.594	0.119
7440-32-6	22	Ti	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
7440-62-2	23	V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
7440-47-3	24	Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
7439-96-5	25	Mn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
7439-89-6	26	Fe	0.312	0.000	0.312	0.000	0.312	0.000	0.312	0.062
7440-02-0	28	Ni	0.093	0.000	0.093	0.000	0.093	0.000	0.093	0.019
7440-50-8	29	Cu	18.755	0.000	18.755	0.000	18.755	0.000	18.755	3.751
7440-66-6	30	Zn	2.745	0.000	2.745	0.000	2.745	0.000	2.745	0.549
7440-55-3	31	Ga	0.027	0.000	0.027	0.000	0.027	0.000	0.027	0.035
7440-38-2	33	As	0.135	0.000	0.135	0.000	0.135	0.000	0.135	0.410
7782-49-2	34	Se	0.157	0.000	0.157	0.000	0.157	0.000	0.157	0.031
7726-95-6	35	Br	0.017	0.000	0.017	0.000	0.017	0.000	0.017	0.011
7440-17-7	37	Rb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
7440-24-6	38	Sr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009
7440-65-5	39	Y	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030
7440-67-7	40	Zr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039
7439-98-7	42	Mo	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032
7440-05-3	46	Pd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032
7440-22-4	47	Ag	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.057
7440-74-6	49	In	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063
7440-31-5	50	Sn	0.532	0.000	0.532	0.000	0.532	0.000	0.532	0.115
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.097
7440-39-3	56	Ba	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.319
7439-91-0	57	La	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.638
7439-97-6	80	Hg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010
7439-92-1	82	Pb	7.159	0.000	7.159	0.000	7.159	0.000	7.159	1.432
TOTALS:			33.198		33.198		33.198		33.198	

(1) No control specified: thus, assumed uncontrolled.
(2) Estimated / extrapolated.

3.5 MINERAL PRODUCTS INDUSTRY

Production and processing of minerals produces particulate emissions frequently of the same composition as the finished product. This is because most of the processes involved generate dust. These processes include quarrying, crushing, screening, drying, and storage and handling.

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PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Portland Cement Dust
Profile Number : 27204
Data Quality   : E
--------------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1
Data Source    : Unspecified methodology.

SCC Assignments: 30500618, 30500619

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.300         0.620           0.850
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                         Total
                                 0-2.5 um(2)   2.5-10 um(2)   0-10 um(2)    Measured
                    Species      ------------  ------------  ------------  ------------
 CAS Number   Num   Sym          %wt    unc    %wt    unc    %wt    unc    %wt    unc
--------------------------------------------------------------------------------
  7429-90-5   13    Al          2.000  0.000   2.000  0.000   2.000  0.000   2.000  0.400
  7440-21-3   14    Si         10.200  0.000  10.200  0.000  10.200  0.000  10.200  2.000
  7723-14-0   15    P           0.100  0.000   0.100  0.000   0.100  0.000   0.100  0.020
  7704-34-9   16    S           0.880  0.000   0.880  0.000   0.880  0.000   0.880  0.170
  7440-09-7   19    K           0.140  0.000   0.140  0.000   0.140  0.000   0.140  0.028
  7440-70-2   20    Ca         46.100  0.000  46.100  0.000  46.100  0.000  46.100  4.610
  7440-32-6   22    Ti          0.140  0.000   0.140  0.000   0.140  0.000   0.140  0.028
  7440-47-3   24    Cr          0.007  0.000   0.007  0.000   0.007  0.000   0.007  0.001
  7439-96-5   25    Mn          0.030  0.000   0.030  0.000   0.030  0.000   0.030  0.006
  7439-89-6   26    Fe          2.940  0.000   2.940  0.000   2.940  0.000   2.940  0.580
  7440-66-6   30    Zn          0.008  0.000   0.008  0.000   0.008  0.000   0.008  0.002
  7440-24-6   38    Sr          0.260  0.000   0.260  0.000   0.260  0.000   0.260  0.052
--------------------------------------------------------------------------------
TOTALS:                        62.805         62.805         62.805         62.805
================================================================================
(1)  No control specified: thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
```

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PM Profile Speciation Report

Profile Name : Cement Ball Mill
Profile Number : 27205
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30500609, 30500610

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.300	0.620	0.850

Total Particulate Matter -

	Species		0-2.5 um(2)		2.5-10 um(2)		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	2.542	0.000	2.542	0.000	2.542	0.000	2.542	0.639
7440-21-3	14	Si	8.363	0.000	8.363	0.000	8.363	0.000	8.363	2.332
7723-14-0	15	P	0.105	0.000	0.105	0.000	0.105	0.000	0.105	0.029
7704-34-9	16	S	2.357	0.000	2.357	0.000	2.357	0.000	2.357	0.480
7782-50-5	17	Cl	0.328	0.000	0.328	0.000	0.328	0.000	0.328	0.049
7440-09-7	19	K	0.873	0.000	0.873	0.000	0.873	0.000	0.873	0.131
7440-70-2	20	Ca	24.175	0.000	24.175	0.000	24.175	0.000	24.175	3.626
7440-32-6	22	Ti	0.186	0.000	0.186	0.000	0.186	0.000	0.186	0.029
7440-62-2	23	V	0.016	0.000	0.016	0.000	0.016	0.000	0.016	0.004
7440-47-3	24	Cr	0.016	0.000	0.016	0.000	0.016	0.000	0.016	0.002
7439-96-5	25	Mn	0.273	0.000	0.273	0.000	0.273	0.000	0.273	0.041
7439-89-6	26	Fe	1.221	0.000	1.221	0.000	1.221	0.000	1.221	0.183
7440-02-0	28	Ni	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.001
7440-50-8	29	Cu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
7440-66-6	30	Zn	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.002
7440-55-3	31	Ga	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-38-2	33	As	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.001
7782-49-2	34	Se	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7726-95-6	35	Br	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.001
7440-17-7	37	Rb	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.002
7440-24-6	38	Sr	0.091	0.000	0.091	0.000	0.091	0.000	0.091	0.014
7440-65-5	39	Y	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.001
7440-67-7	40	Zr	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.005
7439-98-7	42	Mo	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.003
7440-05-3	46	Pd	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.002
7440-22-4	47	Ag	0.008	0.000	0.008	0.000	0.008	0.000	0.008	0.003
7440-43-9	48	Cd	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.005
7440-74-6	49	In	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
7440-31-5	50	Sn	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.005
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009
7440-39-3	56	Ba	0.063	0.000	0.063	0.000	0.063	0.000	0.063	0.024
7439-91-0	57	La	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.034
7439-97-6	80	Hg	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.001
7439-92-1	82	Pb	0.011	0.000	0.011	0.000	0.011	0.000	0.011	0.002
TOTALS:			40.727		40.727		40.727		40.727	

(1) No control specified: thus, assumed uncontrolled.
(2) Estimated / extrapolated.

```
PM Profile Speciation Report
-----------------------------------------------------------------------------------
Profile Name   : Gypsum Handling
Profile Number : 27502
Data Quality   : E
-----------------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1
Data Source    : Unspecified methodology.

SCC Assignments: 30501504, 30501508

Mass Fraction Data -  Size Interval (um) :     (0-2.5)         (0-6)          (0-10)
                      Mass Fraction      :      0.300          0.620           0.850
-----------------------------------------------------------------------------------
Total Particulate Matter -
                                                                            Total
                                0-2.5 um(2)   2.5-10 um(2)   0-10 um(2)    Measured
               Species         ------------  ------------  ------------  ------------
 CAS Number  Num   Sym          %wt    unc    %wt    unc    %wt    unc    %wt    unc
-----------------------------------------------------------------------------------
  7704-34-9   16   S          18.600  0.000  18.600  0.000  18.600  0.000  18.600  1.860
  7440-70-2   20   Ca         23.300  0.000  23.300  0.000  23.300  0.000  23.300  2.330
             203   SO4        55.800  0.000  55.800  0.000  55.800  0.000  55.800  5.580
-----------------------------------------------------------------------------------
TOTALS:                       97.700         97.700         97.700         97.700
===================================================================================
(1)  No control specified: thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Gypsum Kiln
Profile Number : 27503
Data Quality : E

Control Device : ESP
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30501520

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.180	0.370	0.850

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured(2)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	2.044	0.204	1.200	0.120	1.487	0.147	1.487	0.000
7440-21-3	14	Si	1.036	0.283	0.728	0.127	0.832	0.135	0.832	0.000
7723-14-0	15	P	1.733	0.348	0.736	0.149	1.074	0.172	1.074	0.000
7704-34-9	16	S	11.783	1.178	15.456	1.546	14.208	1.256	14.208	0.000
7782-50-5	17	Cl	0.000	0.063	0.000	0.073	0.000	0.048	0.000	0.000
7440-09-7	19	K	0.148	0.037	0.058	0.028	0.088	0.023	0.088	0.000
7440-70-2	20	Ca	23.792	2.379	20.938	2.094	21.907	1.991	21.907	0.000
7440-32-6	22	Ti	0.530	0.053	0.179	0.018	0.298	0.035	0.298	0.000
7440-62-2	23	V	0.334	0.033	0.089	0.009	0.172	0.022	0.172	0.000
7440-47-3	24	Cr	0.123	0.012	0.032	0.003	0.063	0.009	0.063	0.000
7439-96-5	25	Mn	0.068	0.007	0.022	0.002	0.038	0.006	0.038	0.000
7439-89-6	26	Fe	0.928	0.093	0.327	0.033	0.531	0.061	0.531	0.000
7440-02-0	28	Ni	0.010	0.004	0.002	0.001	0.005	0.002	0.005	0.000
7440-50-8	29	Cu	0.019	0.004	0.018	0.002	0.018	0.004	0.018	0.000
7440-66-6	30	Zn	0.017	0.003	0.007	0.001	0.010	0.003	0.010	0.000
7440-55-3	31	Ga	0.003	0.002	0.001	0.001	0.002	0.001	0.002	0.000
7440-38-2	33	As	0.000	0.009	0.000	0.003	0.000	0.003	0.000	0.000
7782-49-2	34	Se	0.002	0.003	0.001	0.001	0.001	0.001	0.001	0.000
7726-95-6	35	Br	0.015	0.004	0.004	0.001	0.008	0.002	0.008	0.000
7440-17-7	37	Rb	0.007	0.004	0.007	0.001	0.007	0.002	0.007	0.000
7440-24-6	38	Sr	1.768	0.177	0.697	0.070	1.061	0.116	1.061	0.000
7440-65-5	39	Y	0.058	0.007	0.017	0.002	0.031	0.005	0.031	0.000
7440-67-7	40	Zr	0.178	0.085	0.073	0.033	0.108	0.037	0.108	0.000
7439-98-7	42	Mo	0.015	0.016	0.005	0.006	0.008	0.007	0.008	0.000
7440-05-3	46	Pd	0.032	0.015	0.000	0.006	0.011	0.006	0.011	0.000
7440-22-4	47	Ag	0.000	0.020	0.009	0.008	0.006	0.009	0.006	0.000
7440-43-9	48	Cd	0.000	0.029	0.014	0.011	0.010	0.012	0.010	0.000
7440-74-6	49	In	0.000	0.032	0.000	0.011	0.000	0.013	0.000	0.000
7440-31-5	50	Sn	0.000	0.035	0.000	0.015	0.000	0.015	0.000	0.000
7440-36-0	51	Sb	0.000	0.066	0.000	0.024	0.000	0.026	0.000	0.000
7440-39-3	56	Ba	0.260	0.189	0.114	0.072	0.164	0.078	0.164	0.000
7439-91-0	57	La	0.077	0.270	0.098	0.103	0.091	0.110	0.091	0.000
7439-97-6	80	Hg	0.009	0.005	0.004	0.002	0.005	0.002	0.005	0.000
7439-92-1	82	Pb	0.083	0.012	0.036	0.005	0.052	0.008	0.052	0.000
TOTALS:			45.072		40.872		42.296		42.296	

(1) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

(2) Estimated / extrapolated.

```
PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Lime Handling
Profile Number : 27601
Data Quality   : E
------------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1
Data Source    : Unspecified methodology.

SCC Assignments: 30501607, 30501608, 30501615

Mass Fraction Data -  Size Interval (um) :    (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :     0.300         0.620          0.850
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                      Total
                                0-2.5 um(2)  2.5-10 um(2)  0-10 um(2)   Measured
                  Species      -----------  -----------  -----------  -----------
 CAS Number   Num   Sym         %wt    unc    %wt    unc    %wt    unc    %wt    unc
------------------------------------------------------------------------------
  7440-70-2   20    Ca        71.000 0.000 71.000 0.000 71.000 0.000 71.000 7.100
------------------------------------------------------------------------------
TOTALS:                       71.000       71.000       71.000       71.000
==============================================================================
(1)  No control specified: thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Lime Kiln
Profile Number : 27602
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30700106

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.180	0.370	0.530

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	1.138	0.114	0.765	0.077	0.892	0.087	0.868	0.087
7440-21-3	14	Si	1.812	0.222	1.300	0.130	1.474	0.147	1.440	0.144
7723-14-0	15	P	0.231	0.047	0.088	0.031	0.136	0.028	0.128	0.035
7704-34-9	16	S	7.531	0.753	3.819	0.382	5.080	0.515	4.851	0.485
7782-50-5	17	Cl	0.439	0.218	0.287	0.034	0.338	0.081	0.330	0.086
7440-09-7	19	K	1.825	1.322	0.166	0.037	0.729	0.458	0.633	0.390
7440-70-2	20	Ca	22.580	2.258	26.651	2.665	25.268	2.239	25.510	2.551
7440-32-6	22	Ti	0.030	0.007	0.037	0.004	0.035	0.006	0.035	0.005
7440-62-2	23	V	0.006	0.001	0.005	0.001	0.005	0.002	0.005	0.001
7440-47-3	24	Cr	0.008	0.003	0.008	0.001	0.008	0.002	0.008	0.001
7439-96-5	25	Mn	0.240	0.045	0.198	0.020	0.212	0.026	0.209	0.021
7439-89-6	26	Fe	1.870	0.405	1.590	0.159	1.685	0.199	1.666	0.167
7440-02-0	28	Ni	0.004	0.001	0.005	0.001	0.005	0.002	0.005	0.001
7440-50-8	29	Cu	0.007	0.003	0.007	0.001	0.007	0.002	0.007	0.001
7440-66-6	30	Zn	0.007	0.001	0.005	0.001	0.006	0.002	0.006	0.001
7440-55-3	31	Ga	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.000
7440-38-2	33	As	0.017	0.003	0.004	0.001	0.009	0.002	0.008	0.002
7782-49-2	34	Se	0.002	0.002	0.001	0.000	0.001	0.001	0.001	0.001
7726-95-6	35	Br	0.012	0.002	0.003	0.000	0.006	0.002	0.005	0.001
7440-17-7	37	Rb	0.013	0.007	0.003	0.001	0.006	0.003	0.005	0.002
7440-24-6	38	Sr	0.011	0.003	0.014	0.001	0.013	0.003	0.013	0.001
7440-65-5	39	Y	0.002	0.002	0.003	0.001	0.003	0.002	0.003	0.001
7440-67-7	40	Zr	0.006	0.008	0.005	0.003	0.005	0.004	0.005	0.004
7439-98-7	42	Mo	0.016	0.004	0.012	0.002	0.013	0.003	0.013	0.003
7440-05-3	46	Pd	0.012	0.004	0.009	0.002	0.010	0.003	0.010	0.002
7440-22-4	47	Ag	0.010	0.005	0.005	0.003	0.006	0.003	0.006	0.003
7440-43-9	48	Cd	0.001	0.008	0.001	0.004	0.001	0.003	0.001	0.005
7440-74-6	49	In	0.006	0.008	0.007	0.004	0.007	0.004	0.007	0.005
7440-31-5	50	Sn	0.017	0.009	0.004	0.004	0.008	0.004	0.008	0.006
7440-36-0	51	Sb	0.003	0.016	0.000	0.008	0.001	0.007	0.001	0.010
7440-39-3	56	Ba	0.035	0.048	0.000	0.020	0.012	0.020	0.009	0.026
7439-91-0	57	La	0.000	0.064	0.000	0.030	0.000	0.028	0.000	0.040
7439-97-6	80	Hg	0.006	0.001	0.003	0.001	0.004	0.002	0.004	0.001
7439-92-1	82	Pb	0.044	0.010	0.015	0.002	0.025	0.005	0.023	0.004
TOTALS:			37.942		35.021		36.011		35.824	

(1) No control specified: thus, assumed uncontrolled.
(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

3.6 PETROLEUM INDUSTRY

The petroleum industry includes petroleum refining and natural gas processing. Petroleum refining involves the production of several fuels, oils, and feeds for the petrochemical industry from crude oil. Refining processes include distillation, conversion, treatment, and storage and handling processes. The most significant sources of emissions include vacuum distillation, catalytic cracking, thermal cracking, boilers, and heaters. Particulate emissions are also generated from the burning and processing of petroleum coke.

PM Profile Speciation Report

Profile Name : Petroleum Refinery Catalytic Cracker
Profile Number : 26203
Data Quality : C

Control Device : Uncontrolled(1)
Reference(s) : 1
Data Source : Size-selective dilution samplers used to collect three samples with two dichotomous virtual impactors. Spectrographic analysis used.

SCC Assignments: 30600201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.450	0.700	0.790

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(2)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	18.377	2.426	18.761	3.154	18.481	3.310	18.481	0.000
7440-21-3	14	Si	17.845	2.479	17.395	2.808	17.628	3.668	17.628	0.000
7723-14-0	15	P	0.042	0.024	0.055	0.009	0.048	0.023	0.048	0.000
7704-34-9	16	S	1.647	0.380	0.504	0.092	1.189	0.329	1.189	0.000
7782-50-5	17	Cl	0.246	0.069	0.253	0.061	0.252	0.082	0.252	0.000
7440-09-7	19	K	0.179	0.016	0.119	0.017	0.154	0.033	0.154	0.000
7440-70-2	20	Ca	0.156	0.024	0.177	0.033	0.165	0.044	0.165	0.000
7440-32-6	22	Ti	0.799	0.093	0.825	0.163	0.806	0.188	0.806	0.000
7440-62-2	23	V	0.000	0.199	0.000	0.239	0.000	0.246	0.000	0.000
7440-47-3	24	Cr	0.000	0.078	0.000	0.096	0.000	0.098	0.000	0.000
7439-96-5	25	Mn	0.000	0.030	0.000	0.039	0.000	0.039	0.000	0.000
7439-89-6	26	Fe	0.688	0.113	0.822	0.094	0.744	0.152	0.744	0.000
7440-02-0	28	Ni	0.017	0.010	0.033	0.004	0.024	0.012	0.024	0.000
7440-50-8	29	Cu	0.001	0.002	0.001	0.002	0.001	0.003	0.001	0.000
7440-66-6	30	Zn	0.012	0.007	0.014	0.003	0.013	0.008	0.013	0.000
7440-55-3	31	Ga	0.003	0.002	0.003	0.001	0.003	0.003	0.003	0.000
7440-38-2	33	As	0.010	0.007	0.000	0.001	0.006	0.005	0.006	0.000
7782-49-2	34	Se	0.006	0.002	0.006	0.001	0.006	0.004	0.006	0.000
7726-95-6	35	Br	0.003	0.004	0.009	0.001	0.005	0.006	0.005	0.000
7440-17-7	37	Rb	0.000	0.002	0.000	0.001	0.000	0.002	0.000	0.000
7440-24-6	38	Sr	0.000	0.003	0.012	0.004	0.005	0.007	0.005	0.000
7440-65-5	39	Y	0.000	0.004	0.013	0.003	0.005	0.007	0.005	0.000
7440-67-7	40	Zr	0.000	0.015	0.000	0.004	0.000	0.011	0.000	0.000
7439-98-7	42	Mo	0.000	0.010	0.000	0.002	0.000	0.007	0.000	0.000
7440-05-3	46	Pd	0.000	0.010	0.000	0.002	0.000	0.007	0.000	0.000
7440-22-4	47	Ag	0.000	0.013	0.000	0.003	0.000	0.010	0.000	0.000
7440-43-9	48	Cd	0.000	0.017	0.000	0.004	0.000	0.012	0.000	0.000
7440-74-6	49	In	0.000	0.021	0.000	0.005	0.000	0.016	0.000	0.000
7440-31-5	50	Sn	0.000	0.025	0.000	0.006	0.000	0.019	0.000	0.000
7440-36-0	51	Sb	0.000	0.057	0.000	0.013	0.000	0.042	0.000	0.000
7440-39-3	56	Ba	0.000	0.105	0.000	0.025	0.000	0.077	0.000	0.000
7439-91-0	57	La	0.431	0.318	0.594	0.266	0.512	0.326	0.512	0.000
7440-45-1	58	Ce	1.357	0.122	1.285	0.280	1.316	0.306	1.316	0.000
7440-00-8	60	Nd	0.404	0.060	0.361	0.075	0.382	0.095	0.382	0.000

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PM Profile Speciation Report  -  continued (profile 26203)
----------------------------------------------------------------------------
Total Particulate Matter -
                                                                    Total
                              0-2.5 um     2.5-10 um     0-10 um   Measured(2)
               Species      ------------  ------------  ------------  -----------
 CAS Number  Num   Sym       %wt    unc    %wt    unc    %wt    unc    %wt    unc
----------------------------------------------------------------------------
  7439-97-6   80   Hg       0.001  0.002  0.001  0.000  0.001  0.002  0.001  0.000
  7439-92-1   82   Pb       0.000  0.006  0.031  0.006  0.013  0.012  0.013  0.000
----------------------------------------------------------------------------
TOTALS:                    42.224        41.274        41.759        41.759
============================================================================
(1)  No control specified: thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Petroleum Refinery Catalytic Cracker
Profile Number : 26204
Data Quality : C

Control Device : Uncontrolled(1)
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30600201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.450	0.700	0.790

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured(3)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	21.412	2.141	16.911	1.691	19.475	2.658	19.475	0.000
7440-21-3	14	Si	43.462	4.346	32.652	3.265	38.809	6.442	38.809	0.000
7723-14-0	15	P	0.249	0.052	0.125	0.025	0.196	0.053	0.196	0.000
7704-34-9	16	S	0.324	0.077	0.192	0.026	0.267	0.073	0.267	0.000
7782-50-5	17	Cl	0.059	0.028	0.012	0.010	0.038	0.023	0.038	0.000
7440-09-7	19	K	0.148	0.022	0.115	0.012	0.134	0.031	0.134	0.000
7440-70-2	20	Ca	0.247	0.025	0.319	0.032	0.278	0.055	0.278	0.000
7440-32-6	22	Ti	0.998	0.100	1.065	0.107	1.027	0.178	1.027	0.000
7440-62-2	23	V	0.441	0.044	0.447	0.045	0.444	0.081	0.444	0.000
7440-47-3	24	Cr	0.113	0.013	0.118	0.019	0.115	0.029	0.115	0.000
7439-96-5	25	Mn	0.065	0.008	0.065	0.007	0.065	0.018	0.065	0.000
7439-89-6	26	Fe	0.956	0.096	0.829	0.083	0.901	0.156	0.901	0.000
7440-02-0	28	Ni	0.251	0.025	0.171	0.017	0.217	0.042	0.217	0.000
7440-50-8	29	Cu	0.047	0.009	0.068	0.007	0.056	0.018	0.056	0.000
7440-66-6	30	Zn	0.040	0.007	0.027	0.003	0.034	0.011	0.034	0.000
7440-55-3	31	Ga	0.000	0.005	0.004	0.002	0.002	0.005	0.002	0.000
7440-38-2	33	As	0.000	0.017	0.000	0.006	0.000	0.013	0.000	0.000
7782-49-2	34	Se	0.000	0.004	0.001	0.001	0.000	0.003	0.000	0.000
7726-95-6	35	Br	0.015	0.006	0.003	0.001	0.010	0.005	0.010	0.000
7440-17-7	37	Rb	0.000	0.006	0.007	0.002	0.003	0.006	0.003	0.000
7440-24-6	38	Sr	0.017	0.008	0.019	0.003	0.018	0.010	0.018	0.000
7440-65-5	39	Y	0.003	0.009	0.018	0.003	0.009	0.010	0.009	0.000
7440-67-7	40	Zr	0.000	0.040	0.023	0.011	0.010	0.031	0.010	0.000
7439-98-7	42	Mo	0.000	0.030	0.000	0.008	0.000	0.022	0.000	0.000
7440-05-3	46	Pd	0.000	0.028	0.000	0.008	0.000	0.021	0.000	0.000
7440-22-4	47	Ag	0.000	0.042	0.017	0.011	0.007	0.032	0.007	0.000
7440-43-9	48	Cd	0.011	0.055	0.006	0.015	0.009	0.041	0.009	0.000
7440-74-6	49	In	0.098	0.061	0.001	0.017	0.056	0.047	0.056	0.000
7440-31-5	50	Sn	0.072	0.074	0.008	0.022	0.045	0.057	0.045	0.000
7440-36-0	51	Sb	0.174	0.126	0.009	0.036	0.103	0.096	0.103	0.000
7440-39-3	56	Ba	0.000	0.352	0.000	0.097	0.000	0.262	0.000	0.000
7439-91-0	57	La	0.196	0.526	0.995	0.270	0.540	0.446	0.540	0.000
7439-97-6	80	Hg	0.017	0.008	0.002	0.002	0.010	0.006	0.010	0.000
7439-92-1	82	Pb	0.150	0.024	0.066	0.007	0.114	0.027	0.114	0.000
TOTALS:			69.565		54.295		62.992		62.992	

---

(1) No control specified: thus, assumed uncontrolled.

(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

(3) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Petroleum Refinery Catalytic Cracker
Profile Number : 26205
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,2
Data Source : Four samples analyzed using XRF and neutron activation.

SCC Assignments: 30600201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.450	0.700	0.790

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.360	0.040	0.944	0.118	0.611	0.121	0.384	0.064
7429-90-5	13	Al	6.500	1.100	16.520	2.360	10.812	2.530	6.911	1.396
7440-21-3	14	Si	9.800	1.300	49.560	2.950	26.912	4.525	11.430	1.912
7723-14-0	15	P	0.160	0.030	NR	0.000	NE	0.000	0.153	0.036
7704-34-9	16	S	4.200	0.500	4.012	1.829	4.119	1.663	4.192	0.748
7782-50-5	17	Cl	NR	0.000	0.384	0.153	NE	0.000	0.016	0.007
7440-09-7	19	K	0.031	0.005	0.118	0.018	0.068	0.025	0.035	0.007
7440-70-2	20	Ca	0.030	0.004	0.159	0.035	0.086	0.038	0.035	0.006
7440-22-2	21	Sc	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000
7440-32-6	22	Ti	0.350	0.090	0.708	0.708	0.504	0.604	0.365	0.103
7440-62-2	23	V	0.023	0.007	0.049	0.027	0.034	0.026	0.024	0.008
7440-47-3	24	Cr	0.006	0.001	0.015	0.002	0.010	0.007	0.006	0.001
7439-96-5	25	Mn	0.001	0.000	0.005	0.001	0.003	0.004	0.001	0.000
7439-89-6	26	Fe	0.200	0.030	0.590	0.030	0.368	0.070	0.216	0.040
7440-48-4	27	Co	0.001	0.000	0.004	0.001	0.003	0.003	0.002	0.000
7440-02-0	28	Ni	0.022	0.003	0.058	0.010	0.037	0.016	0.024	0.004
7440-50-8	29	Cu	0.001	0.001	0.008	0.007	0.004	0.007	0.002	0.001
7440-66-6	30	Zn	0.002	0.001	0.012	0.001	0.006	0.006	0.003	0.001
7440-38-2	33	As	NR	0.000	0.004	0.001	NE	0.000	0.000	0.000
7782-49-2	34	Se	0.001	0.000	0.001	0.000	0.001	0.002	0.001	0.000
7726-95-6	35	Br	0.001	0.000	0.004	0.001	0.002	0.003	0.001	0.000
7440-17-7	37	Rb	NR	0.000	0.007	0.003	NE	0.000	0.000	0.000
7440-24-6	38	Sr	0.004	0.001	0.012	0.001	0.007	0.006	0.004	0.001
7440-67-7	40	Zr	0.012	0.004	0.094	0.030	0.047	0.031	0.015	0.004
7440-31-5	50	Sn	0.005	0.002	NR	0.000	NE	0.000	0.005	0.002
7440-36-0	51	Sb	0.001	0.000	0.002	0.003	0.001	0.003	0.001	0.000
7440-39-3	56	Ba	0.032	0.004	NR	0.000	NE	0.000	0.031	0.006
7439-91-0	57	La	0.310	0.040	0.873	0.041	0.552	0.096	0.333	0.058
7440-45-1	58	Ce	0.250	0.040	0.684	0.041	0.437	0.083	0.268	0.052
7440-00-8	60	Nd	0.170	0.020	0.454	0.035	0.292	0.061	0.182	0.031
7440-19-9	62	Sm	0.016	0.002	0.045	0.002	0.028	0.012	0.017	0.003
7440-53-1	63	Eu	0.001	0.000	0.001	0.000	0.001	0.002	0.001	0.000
7440-54-2	64	Gd	0.007	0.001	0.017	0.003	0.011	0.007	0.007	0.001
7440-27-9	65	Tb	0.001	0.000	0.002	0.000	0.001	0.003	0.001	0.000
7440-64-4	70	Yb	0.000	0.000	0.001	0.000	0.001	0.002	0.000	0.000
7440-58-6	72	Hf	NR	0.000	0.000	0.000	NE	0.000	0.000	0.000

PM Profile Speciation Report - continued (profile 26205)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um(2) %wt	0-10 um(2) unc	Total Measured %wt	Total Measured unc
7440-25-7	73	Ta	NR	0.000	0.000	0.000	NE	0.000	0.000	0.000
7439-92-1	82	Pb	0.009	0.002	0.033	0.013	0.019	0.015	0.010	0.003
7440-29-1	90	Th	0.001	0.000	0.002	0.000	0.001	0.002	0.001	0.000
	201	OC	0.280	0.990	NR	0.000	NE	0.000	0.269	0.950
	202	EC	0.160	0.050	0.277	0.071	0.210	0.079	0.165	0.053
	203	SO4	38.000	4.000	NR	0.000	NE	0.000	36.443	6.341
	204	NO3	0.051	0.220	NR	0.000	NE	0.000	0.049	0.022
TOTALS:			60.999		75.660		45.188		61.603	

(1) No control specified: thus, assumed uncontrolled.

(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Coke Calciner
Profile Number : 26206
Data Quality : D

Control Device : Baghouse
Reference(s) : 1
Data Source : Baghouse catch dust sampled by operating personnel.

SCC Assignments: 30601401

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.180	0.370	0.530

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.054	0.054	0.150	0.051	0.141	0.037	0.141	0.000
7440-21-3	14	Si	0.000	0.047	0.105	0.047	0.095	0.033	0.095	0.000
7723-14-0	15	P	0.000	0.060	0.000	0.052	0.000	0.037	0.000	0.000
7704-34-9	16	S	16.184	0.824	15.272	0.816	15.355	1.089	15.355	0.000
7782-50-5	17	Cl	0.000	0.039	0.000	0.033	0.000	0.023	0.000	0.000
7440-09-7	19	K	0.037	0.037	0.061	0.039	0.058	0.027	0.058	0.000
7440-70-2	20	Ca	25.778	1.293	28.154	1.410	27.937	1.826	27.937	0.000
7440-32-6	22	Ti	0.009	0.002	0.006	0.001	0.007	0.002	0.007	0.000
7440-62-2	23	V	0.105	0.007	0.122	0.007	0.120	0.012	0.120	0.000
7440-47-3	24	Cr	0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.000
7439-96-5	25	Mn	0.000	0.002	0.006	0.001	0.005	0.002	0.005	0.000
7439-89-6	26	Fe	0.059	0.005	0.096	0.006	0.093	0.010	0.093	0.000
7440-02-0	28	Ni	0.028	0.003	0.035	0.002	0.035	0.005	0.035	0.000
7440-50-8	29	Cu	0.000	0.001	0.002	0.001	0.002	0.001	0.002	0.000
7440-66-6	30	Zn	0.005	0.001	0.006	0.001	0.006	0.002	0.006	0.000
7440-55-3	31	Ga	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7440-38-2	33	As	0.000	0.003	0.000	0.001	0.000	0.001	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7726-95-6	35	Br	0.002	0.001	0.004	0.001	0.003	0.002	0.003	0.000
7440-17-7	37	Rb	0.000	0.002	0.001	0.001	0.001	0.001	0.001	0.000
7440-24-6	38	Sr	0.018	0.003	0.022	0.001	0.022	0.004	0.022	0.000
7440-65-5	39	Y	0.000	0.003	0.000	0.001	0.000	0.001	0.000	0.000
7440-67-7	40	Zr	0.000	0.011	0.000	0.004	0.000	0.004	0.000	0.000
7439-98-7	42	Mo	0.000	0.007	0.000	0.003	0.000	0.003	0.000	0.000
7440-05-3	46	Pd	0.000	0.008	0.000	0.003	0.000	0.003	0.000	0.000
7440-22-4	47	Ag	0.000	0.009	0.000	0.003	0.000	0.004	0.000	0.000
7440-43-9	48	Cd	0.000	0.012	0.000	0.004	0.000	0.005	0.000	0.000
7440-74-6	49	In	0.000	0.015	0.000	0.005	0.000	0.006	0.000	0.000
7440-31-5	50	Sn	0.000	0.018	0.000	0.006	0.000	0.007	0.000	0.000
7440-36-0	51	Sb	0.000	0.041	0.000	0.013	0.000	0.016	0.000	0.000
7440-39-3	56	Ba	0.000	0.073	0.022	0.024	0.020	0.029	0.020	0.000
7439-91-0	57	La	0.000	0.136	0.000	0.044	0.000	0.053	0.000	0.000
7439-97-6	80	Hg	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.005	0.005	0.018	0.002	0.016	0.004	0.016	0.000
TOTALS:			42.284		44.084		43.918		43.918	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Green Coke Dust
Profile Number : 26207
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30601401

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.150	0.340	0.510

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.101	0.015	0.119	0.012	0.114	0.012	0.113	0.011
7440-21-3	14	Si	0.123	0.012	0.122	0.012	0.122	0.012	0.122	0.011
7723-14-0	15	P	0.080	0.017	0.059	0.012	0.065	0.010	0.066	0.010
7704-34-9	16	S	0.723	0.072	0.687	0.069	0.698	0.059	0.698	0.061
7782-50-5	17	Cl	0.001	0.011	0.000	0.007	0.000	0.005	0.000	0.006
7440-09-7	19	K	0.000	0.004	0.000	0.003	0.000	0.002	0.000	0.002
7440-70-2	20	Ca	0.019	0.004	0.036	0.004	0.031	0.005	0.031	0.003
7440-32-6	22	Ti	0.000	0.002	0.000	0.001	0.000	0.001	0.000	0.001
7440-62-2	23	V	0.017	0.003	0.011	0.001	0.013	0.003	0.013	0.001
7440-47-3	24	Cr	0.000	0.002	0.000	0.001	0.000	0.001	0.000	0.001
7439-96-5	25	Mn	0.001	0.002	0.000	0.001	0.000	0.001	0.000	0.001
7439-89-6	26	Fe	0.022	0.007	0.014	0.003	0.016	0.004	0.017	0.003
7440-02-0	28	Ni	0.022	0.003	0.016	0.002	0.018	0.003	0.018	0.002
7440-50-8	29	Cu	0.004	0.003	0.010	0.002	0.008	0.003	0.008	0.002
7440-66-6	30	Zn	0.006	0.002	0.002	0.001	0.003	0.001	0.003	0.001
7440-55-3	31	Ga	0.000	0.002	0.000	0.001	0.000	0.001	0.000	0.001
7440-38-2	33	As	0.000	0.004	0.000	0.002	0.000	0.002	0.000	0.002
7782-49-2	34	Se	0.002	0.002	0.000	0.001	0.001	0.001	0.001	0.001
7726-95-6	35	Br	0.000	0.002	0.001	0.001	0.001	0.001	0.001	0.001
7440-17-7	37	Rb	0.000	0.003	0.001	0.001	0.001	0.001	0.001	0.001
7440-24-6	38	Sr	0.000	0.003	0.001	0.001	0.001	0.001	0.001	0.001
7440-65-5	39	Y	0.000	0.004	0.000	0.002	0.000	0.002	0.000	0.002
7440-67-7	40	Zr	0.000	0.016	0.000	0.008	0.000	0.006	0.000	0.007
7439-98-7	42	Mo	0.016	0.013	0.000	0.006	0.005	0.005	0.005	0.006
7440-05-3	46	Pd	0.000	0.012	0.000	0.005	0.000	0.004	0.000	0.005
7440-22-4	47	Ag	0.000	0.017	0.000	0.007	0.000	0.006	0.000	0.007
7440-43-9	48	Cd	0.000	0.021	0.000	0.011	0.000	0.009	0.000	0.010
7440-74-6	49	In	0.014	0.023	0.000	0.012	0.004	0.009	0.004	0.011
7440-31-5	50	Sn	0.071	0.031	0.004	0.016	0.024	0.013	0.025	0.015
7440-36-0	51	Sb	0.000	0.047	0.000	0.026	0.000	0.020	0.000	0.023
7440-39-3	56	Ba	0.000	0.142	0.000	0.072	0.000	0.057	0.000	0.066
7439-91-0	57	La	0.000	0.202	0.000	0.105	0.000	0.082	0.000	0.096
7439-97-6	80	Hg	0.003	0.003	0.000	0.001	0.001	0.001	0.001	0.001
7439-92-1	82	Pb	0.002	0.007	0.009	0.004	0.007	0.004	0.010	0.003
	201	OC	NR	0.000	24.600	4.920	NE	0.000	16.966	3.434

PM Profile Speciation Report - continued (profile 26207)

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
	202	EC	NR	0.000	80.500	16.100	NE	0.000	55.517	11.236
TOTALS:			1.227		106.192		1.133		73.621	

(1) No control specified: thus, assumed uncontrolled.

(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Coke Cooler
Profile Number : 26208
Data Quality : D

Control Device : Uncontrolled(1)
Reference(s) : 1,17
Data Source : Data taken from Reference 1. For details, consult Reference 17.

SCC Assignments: 30601201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.150	0.340	0.510

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.211	0.021	0.166	0.042	0.179	0.017	0.180	0.030
7440-21-3	14	Si	0.304	0.056	0.169	0.017	0.209	0.021	0.211	0.026
7723-14-0	15	P	0.142	0.026	0.080	0.018	0.098	0.011	0.099	0.020
7704-34-9	16	S	1.485	0.149	0.702	0.070	0.932	0.089	0.949	0.095
7782-50-5	17	Cl	0.071	0.101	0.000	0.005	0.021	0.004	0.023	0.032
7440-09-7	19	K	0.056	0.007	0.014	0.002	0.026	0.004	0.027	0.003
7440-70-2	20	Ca	0.161	0.016	0.052	0.005	0.084	0.010	0.087	0.009
7440-32-6	22	Ti	0.010	0.002	0.004	0.001	0.006	0.001	0.006	0.001
7440-62-2	23	V	0.100	0.012	0.047	0.005	0.063	0.007	0.064	0.006
7440-47-3	24	Cr	0.011	0.002	0.010	0.001	0.010	0.002	0.010	0.002
7439-96-5	25	Mn	0.007	0.007	0.003	0.005	0.004	0.001	0.004	0.006
7439-89-6	26	Fe	0.329	0.065	0.213	0.057	0.247	0.023	0.250	0.060
7440-02-0	28	Ni	0.038	0.004	0.038	0.004	0.038	0.005	0.038	0.004
7440-50-8	29	Cu	0.003	0.001	0.000	0.001	0.001	0.000	0.001	0.001
7440-66-6	30	Zn	0.007	0.003	0.001	0.001	0.003	0.001	0.003	0.001
7440-55-3	31	Ga	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001
7440-38-2	33	As	0.345	0.219	0.051	0.031	0.138	0.018	0.144	0.092
7782-49-2	34	Se	0.004	0.001	0.001	0.001	0.002	0.001	0.002	0.001
7726-95-6	35	Br	0.023	0.010	0.004	0.002	0.009	0.002	0.010	0.004
7440-17-7	37	Rb	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.001
7440-24-6	38	Sr	0.004	0.002	0.001	0.001	0.001	0.001	0.002	0.001
7440-65-5	39	Y	0.000	0.002	0.000	0.001	0.000	0.000	0.000	0.001
7440-67-7	40	Zr	0.006	0.009	0.000	0.005	0.002	0.000	0.002	0.006
7439-98-7	42	Mo	0.006	0.007	0.004	0.004	0.005	0.001	0.005	0.005
7440-05-3	46	Pd	0.014	0.008	0.005	0.006	0.007	0.002	0.008	0.007
7440-22-4	47	Ag	0.000	0.009	0.000	0.005	0.000	0.000	0.000	0.006
7440-43-9	48	Cd	0.000	0.012	0.000	0.006	0.000	0.000	0.000	0.008
7440-74-6	49	In	0.007	0.012	0.000	0.007	0.002	0.000	0.002	0.008
7440-31-5	50	Sn	0.011	0.015	0.000	0.008	0.003	0.001	0.003	0.010
7440-36-0	51	Sb	0.018	0.025	0.000	0.013	0.005	0.001	0.005	0.017
7440-39-3	56	Ba	0.000	0.069	0.000	0.038	0.000	0.000	0.000	0.048
7439-91-0	57	La	0.051	0.102	0.000	0.055	0.015	0.003	0.016	0.070
7439-97-6	80	Hg	0.005	0.002	0.001	0.001	0.002	0.001	0.002	0.001
7439-92-1	82	Pb	0.007	0.004	0.001	0.002	0.003	0.001	0.003	0.003
	201	OC	3.280	0.328	1.300	0.130	1.882	0.187	1.920	0.192

PM Profile Speciation Report - continued (profile 26208)

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
	202	EC	73.900	7.390	94.700	9.470	88.582	6.953	88.100	8.810
TOTALS:			80.617		97.567		92.579		92.176	

(1) No control specified: thus, assumed uncontrolled.

(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

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PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Catalytic Cracker Composite
Profile Number : 26209
Data Quality   : D
------------------------------------------------------------------------------
Control Device : Uncontrolled
Reference(s)   :
Data Source    : Profile represents a composite of Profiles 26203, 26204,
                 and 26205.

SCC Assignments: 30600201

Mass Fraction Data -  Size Interval (um) :    (0-2.5)       (0-6)          (0-10)
                      Mass Fraction      :     0.450        0.700           0.790
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                               0-2.5 um       2.5-10 um      0-10 um      Measured
                Species      ------------   ------------  ------------  ------------
 CAS Number   Num   Sym       %wt  unc(1)    %wt  unc(1)   %wt  unc(1)   %wt  unc(1)
------------------------------------------------------------------------------
  7429-90-5   13    Al      15.430  0.000  17.397  0.000  16.256  0.000  14.956  0.000
  7440-21-3   14    Si      23.702  0.000  33.202  0.000  27.783  0.000  22.622  0.000
  7723-14-0   15    P        0.150  0.000   0.090  0.000   0.122  0.000   0.132  0.000
  7704-34-9   16    S        2.057  0.000   1.569  0.000   1.858  0.000   1.883  0.000
  7782-50-5   17    Cl       0.153  0.000   0.216  0.000   0.145  0.000   0.102  0.000
  7440-09-7   19    K        0.119  0.000   0.117  0.000   0.119  0.000   0.108  0.000
  7440-70-2   20    Ca       0.144  0.000   0.218  0.000   0.176  0.000   0.159  0.000
  7440-32-6   22    Ti       0.716  0.000   0.866  0.000   0.779  0.000   0.733  0.000
  7440-62-2   23    V        0.155  0.000   0.165  0.000   0.159  0.000   0.156  0.000
  7440-47-3   24    Cr       0.040  0.000   0.044  0.000   0.042  0.000   0.040  0.000
  7439-96-5   25    Mn       0.022  0.000   0.023  0.000   0.023  0.000   0.022  0.000
  7439-89-6   26    Fe       0.615  0.000   0.747  0.000   0.671  0.000   0.620  0.000
  7440-02-0   28    Ni       0.100  0.000   0.087  0.000   0.093  0.000   0.088  0.000
  7440-50-8   29    Cu       0.016  0.000   0.026  0.000   0.020  0.000   0.020  0.000
  7440-66-6   30    Zn       0.018  0.000   0.018  0.000   0.018  0.000   0.017  0.000
  7440-38-2   33    As       0.005  0.000   0.001  0.000   0.003  0.000   0.002  0.000
  7782-49-2   34    Se       0.002  0.000   0.003  0.000   0.002  0.000   0.002  0.000
  7726-95-6   35    Br       0.006  0.000   0.005  0.000   0.057  0.000   0.005  0.000
  7440-17-7   37    Rb       0.000  0.000   0.005  0.000   0.002  0.000   0.001  0.000
  7440-24-6   38    Sr       0.007  0.000   0.014  0.000   0.010  0.000   0.009  0.000
  7440-67-7   40    Zr       0.004  0.000   0.039  0.000   0.019  0.000   0.008  0.000
  7440-31-5   50    Sn       0.026  0.000   0.004  0.000   0.023  0.000   0.017  0.000
  7440-36-0   51    Sb       0.058  0.000   0.004  0.000   0.035  0.000   0.035  0.000
  7440-39-3   56    Ba       0.011  0.000   0.000  0.000   0.000  0.000   0.010  0.000
  7439-91-0   57    La       0.312  0.000   0.821  0.000   0.535  0.000   0.462  0.000
  7439-92-1   82    Pb       0.053  0.000   0.043  0.000   0.049  0.000   0.046  0.000
------------------------------------------------------------------------------
TOTALS:                     43.921         55.724         48.999         42.255
==============================================================================
(1)  Uncertainty not evaluated.
```

3.7 SOLID WASTE DISPOSAL

Solid waste sources can be industrial, urban, agricultural, or construction. Solid waste may be disposed of in landfills or land application units or incinerated. A large percentage of urban and industrial waste is burned. Waste burning processes include open burning and controlled and uncontrolled incineration where significant particulate emissions may be generated.

PM Profile Speciation Report

Profile Name : Municipal Incinerator (East Chicago,IN)
Profile Number : 17107
Data Quality : E

Control Device : Spray chamber and 3-stage scrubbing tower.
Reference(s) : 3,13
Data Source : Samples collected according to EPA incinerator method (HNO3 impingers) and with Andersen impactors. Analyzed by INAA and AA.

SCC Assignments: 50100101

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.260	0.310	0.380

Total Particulate Matter -

	Species		0-2.5 um(1)		2.5-10 um(1)		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	8.200	0.000	8.200	0.000	8.200	0.000	8.200	1.300
7439-95-4	12	Mg	2.800	0.000	2.800	0.000	2.800	0.000	2.800	0.800
7782-50-5	17	Cl	27.000	0.000	27.000	0.000	27.000	0.000	27.000	3.000
7440-47-3	24	Cr	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.002
7439-96-5	25	Mn	0.027	0.000	0.027	0.000	0.027	0.000	0.027	0.008
7439-89-6	26	Fe	0.330	0.000	0.330	0.000	0.330	0.000	0.330	0.150
7440-48-4	27	Co	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-02-0	28	Ni	0.008	0.000	0.008	0.000	0.008	0.000	0.008	0.003
7440-50-8	29	Cu	0.170	0.000	0.170	0.000	0.170	0.000	0.170	0.030
7440-66-6	30	Zn	11.400	0.000	11.400	0.000	11.400	0.000	11.400	2.800
7440-38-2	33	As	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.009
7782-49-2	34	Se	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.004
7726-95-6	35	Br	0.088	0.000	0.088	0.000	0.088	0.000	0.088	0.039
7440-22-4	47	Ag	0.011	0.000	0.011	0.000	0.011	0.000	0.011	0.008
7440-43-9	48	Cd	0.150	0.000	0.150	0.000	0.150	0.000	0.150	0.040
7440-74-6	49	In	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-31-5	50	Sn	1.290	0.000	1.290	0.000	1.290	0.000	1.290	0.160
7440-36-0	51	Sb	0.160	0.000	0.160	0.000	0.160	0.000	0.160	0.080
7440-46-2	55	Cs	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-39-3	56	Ba	0.022	0.000	0.022	0.000	0.022	0.000	0.022	0.013
7439-91-0	57	La	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-19-9	62	Sm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-57-5	79	Au	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	6.900	0.000	6.900	0.000	6.900	0.000	6.900	1.000
7440-29-1	90	Th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTALS:			58.593		58.593		58.593		58.593	

(1) Estimated / extrapolated.

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PM Profile Speciation Report

Profile Name : Municipal Incinerator (Philadelphia)
Profile Number : 17108
Data Quality : E

Control Device : Uncontrolled(1)
Reference(s) : 1,2
Data Source : Data taken from Reference 1. For details, consult Reference 2.

SCC Assignments: 50100101

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.260	0.310	0.380

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	6.200	3.200	5.700	0.800	6.042	0.961	6.148	2.973
7429-90-5	13	Al	0.230	0.100	5.200	0.600	1.799	0.567	0.748	0.130
7440-21-3	14	Si	1.700	0.300	8.600	2.000	3.879	0.953	2.419	0.431
7723-14-0	15	P	0.630	0.120	0.900	0.140	0.715	0.128	0.658	0.136
7704-34-9	16	S	2.900	0.800	3.200	0.700	2.995	0.492	2.931	0.810
7782-50-5	17	Cl	27.000	4.000	15.000	3.000	23.211	3.586	25.750	4.910
7440-09-7	19	K	7.600	2.300	4.500	0.600	6.621	1.026	7.277	2.267
7440-70-2	20	Ca	0.230	0.100	11.200	0.600	3.694	1.211	1.373	0.166
7440-32-6	22	Ti	0.030	0.015	1.500	0.300	0.494	0.169	0.183	0.038
7440-62-2	23	V	0.001	0.001	0.010	0.004	0.004	0.004	0.002	0.001
7440-47-3	24	Cr	0.009	0.003	0.110	0.040	0.041	0.018	0.019	0.005
7439-96-5	25	Mn	0.016	0.003	0.095	0.005	0.041	0.017	0.024	0.004
7439-89-6	26	Fe	0.220	0.050	1.600	0.200	0.656	0.182	0.364	0.062
7440-48-4	27	Co	0.000	0.000	0.003	0.001	0.001	0.002	0.001	0.000
7440-02-0	28	Ni	0.029	0.004	0.110	0.050	0.055	0.019	0.037	0.008
7440-50-8	29	Cu	0.120	0.004	0.073	0.021	0.105	0.020	0.115	0.016
7440-66-6	30	Zn	9.800	0.500	4.200	3.300	8.032	1.249	9.217	1.331
7440-38-2	33	As	0.007	0.003	0.006	0.006	0.006	0.003	0.007	0.003
7782-49-2	34	Se	0.004	0.001	0.007	0.002	0.005	0.004	0.004	0.001
7726-95-6	35	Br	0.230	0.080	0.120	0.050	0.195	0.034	0.219	0.077
7440-17-7	37	Rb	0.022	0.004	0.009	0.004	0.018	0.005	0.021	0.005
7440-24-6	38	Sr	0.009	0.001	0.036	0.009	0.017	0.009	0.012	0.002
7440-67-7	40	Zr	0.029	0.002	NR	0.000	NE	0.000	0.026	0.004
7439-98-7	42	Mo	0.038	0.004	0.011	0.005	0.029	0.006	0.035	0.006
7440-22-4	47	Ag	0.007	0.001	0.008	0.001	0.007	0.004	0.007	0.002
7440-43-9	48	Cd	0.110	0.060	0.079	0.023	0.100	0.020	0.107	0.056
7440-74-6	49	In	0.001	0.000	0.001	0.000	0.001	0.001	0.001	0.000
7440-31-5	50	Sn	0.670	0.190	1.460	0.080	0.919	0.183	0.752	0.193
7440-36-0	51	Sb	0.140	0.080	0.049	0.049	0.111	0.020	0.131	0.074
7440-46-2	55	Cs	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000
7440-39-3	56	Ba	0.083	0.042	NR	0.000	NE	0.000	0.074	0.039
7439-91-0	57	La	0.000	0.000	0.002	0.000	0.001	0.002	0.000	0.000
7440-45-1	58	Ce	NR	0.000	0.001	0.001	NE	0.000	0.000	0.000
7440-19-9	62	Sm	NR	0.000	0.000	0.000	NE	0.000	0.000	0.000
7440-58-6	72	Hf	NR	0.000	0.000	0.000	NE	0.000	0.000	0.000

PM Profile Speciation Report - continued (profile 17108)

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(2)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7439-92-1	82	Pb	5.800	1.200	1.700	0.500	4.505	0.713	5.373	1.288
7440-29-1	90	Th	NR	0.000	0.000	0.000	NE	0.000	0.000	0.000
	201	OC	0.570	0.230	0.570	0.230	0.570	0.097	0.570	0.220
	202	EC	3.500	0.200	2.300	0.500	3.121	0.487	3.375	0.474
	203	SO4	6.800	2.300	12.000	3.000	8.442	1.526	7.342	2.269
TOTALS:			74.736		80.360		76.432		75.323	

(1) No control specified: thus, assumed uncontrolled.

(2) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

```
PM Profile Speciation Report
-------------------------------------------------------------------------------
Profile Name   : Car Shredder
Profile Number : 17109
Data Quality   : E
-------------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1,32
Data Source    : Data taken from Reference 1. For details, consult Refrence
                 32.

SCC Assignments: 31401101, 31401102

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :      0.390         0.480          0.550
-------------------------------------------------------------------------------
Total Particulate Matter -
                                                                          Total
                                  0-2.5 um      2.5-10 um      0-10 um      Measured
                  Species      ------------  ------------  ------------  ------------
 CAS Number   Num   Sym         %wt    unc    %wt    unc    %wt    unc    %wt    unc
-------------------------------------------------------------------------------
  7782-41-4     9   F          0.050  0.050   0.000  5.000   0.035  4.211   0.197  0.157
  7440-23-5    11   Na         0.180  0.240      NR  0.000      NE  0.000      NR  0.000
  7439-95-4    12   Mg         0.100  0.100      NR  0.000      NE  0.000      NR  0.000
  7429-90-5    13   Al         0.470  0.064   1.900  0.350   0.886  0.338   0.556  0.064
  7440-21-3    14   Si         0.870  0.190      NR  0.000      NE  0.000      NR  0.000
  7704-34-9    16   S          0.470  0.085      NR  0.000      NE  0.000      NR  0.000
  7782-50-5    17   Cl         0.680  0.460   8.700  0.790   3.013  0.979   1.161  0.436
  7440-09-7    19   K          0.270  0.180      NR  0.000      NE  0.000      NR  0.000
  7440-70-2    20   Ca         0.480  0.057   5.500  0.710   1.940  0.727   0.781  0.078
  7440-32-6    22   Ti         0.025  0.025      NR  0.000      NE  0.000      NR  0.000
  7440-62-2    23   V          0.001  0.001      NR  0.000      NE  0.000      NR  0.000
  7440-47-3    24   Cr         0.040  0.004   0.000  2.000   0.028  1.684   0.098  0.060
  7439-96-5    25   Mn         0.088  0.045   0.078  0.100   0.085  0.092   0.087  0.043
  7439-89-6    26   Fe         5.760  0.980   3.700  1.100   5.161  1.324   5.636  0.924
  7440-02-0    28   Ni         0.031  0.007   0.000  0.001   0.022  0.006   0.029  0.007
  7440-50-8    29   Cu         0.100  0.014   0.990  0.300   0.359  0.268   0.153  0.022
  7440-66-6    30   Zn         2.100  0.210   0.870  0.120   1.742  0.288   2.026  0.203
  7726-95-6    35   Br         0.490  0.350   8.400  1.100   2.791  1.140   0.965  0.336
  7439-92-1    82   Pb         0.490  0.049   0.000  0.005   0.347  0.060   0.461  0.046
              201   OC         7.700  3.300  31.000  2.800  14.478  4.068   9.098  3.108
              202   EC         0.600  0.060   4.000  4.200   1.589  3.550   0.804  0.258
              203   SO4        0.290  0.030   0.000  6.000   0.206  5.053   0.453  0.182
              204   NO3        0.150  0.150   0.000 15.000   0.106 12.632   0.591  0.472
-------------------------------------------------------------------------------
TOTALS:                       21.435         65.138         32.788         23.096
===============================================================================
(1)  No control specified: thus, assumed uncontrolled.
```

3.8 METAL FABRICATION

Metal fabrication includes establishments engaged in fabricating ferrous and nonferrous metal products, such as metal cans, tinware, handtools, cutlery, general hardware, nonelectric heating apparatus, fabricated structural metal products, metal forgings, metal stampings, and a variety of metal and wire products. Emission sources include, but are not limited to, casting, rolling, forging, welding, and sandblasting of metals.

```
PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Metal Fabrication - Galvanizing (ZnO)
Profile Number : 25701
Data Quality   : E
------------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1,15
Data Source    : Data taken from Reference 1. For details, consult Reference
                 15.

SCC Assignments: 034

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :      0.820         0.890          0.920
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                      Total
                                0-2.5 um(2)  2.5-10 um(2)  0-10 um(2)   Measured
               Species         ------------ ------------ ------------ ------------
  CAS Number  Num  Sym          %wt    unc    %wt    unc    %wt    unc    %wt    unc
------------------------------------------------------------------------------
  7440-66-6   30   Zn         80.000 0.000 80.000 0.000 80.000 0.000 80.000 8.000
------------------------------------------------------------------------------
TOTALS:                       80.000       80.000       80.000       80.000
==============================================================================
(1)  No control specified: thus assumed uncontrolled.
(2)  Estimated / extrapolated.
```

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```
PM Profile Speciation Report
-------------------------------------------------------------------------------
Profile Name   : Metal Fabrication - Sandblasting
Profile Number : 25702
Data Quality   : E
-------------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1,15
Data Source    : Data taken from Reference 1. For details, consult Reference
                 15.

SCC Assignments: 30900202

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :      0.300         0.620          0.850
-------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                               0-2.5 um(2)   2.5-10 um(2)   0-10 um(2)    Measured
                  Species     ------------  ------------  ------------  ------------
 CAS Number     Num   Sym      %wt    unc    %wt    unc    %wt    unc    %wt    unc
-------------------------------------------------------------------------------
  7440-23-5    11   Na       0.800  0.000  0.800  0.000  0.800  0.000  0.800  0.080
  7429-90-5    13   Al       0.750  0.000  0.750  0.000  0.750  0.000  0.750  0.075
  7440-21-3    14   Si      40.000  0.000 40.000  0.000 40.000  0.000 40.000  4.000
  7704-34-9    16   S        0.880  0.000  0.880  0.000  0.880  0.000  0.880  0.088
  7782-50-5    17   Cl       2.800  0.000  2.800  0.000  2.800  0.000  2.800  0.280
  7440-09-7    19   K        0.700  0.000  0.700  0.000  0.700  0.000  0.700  0.070
  7440-70-2    20   Ca       0.820  0.000  0.820  0.000  0.820  0.000  0.820  0.082
  7440-32-6    22   Ti       0.400  0.000  0.400  0.000  0.400  0.000  0.400  0.040
  7440-62-2    23   V        0.003  0.000  0.003  0.000  0.003  0.000  0.003  0.000
  7440-47-3    24   Cr       0.580  0.000  0.580  0.000  0.580  0.000  0.580  0.058
  7439-96-5    25   Mn       0.140  0.000  0.140  0.000  0.140  0.000  0.140  0.014
  7439-89-6    26   Fe       6.300  0.000  6.300  0.000  6.300  0.000  6.300  0.630
  7440-02-0    28   Ni       0.320  0.000  0.320  0.000  0.320  0.000  0.320  0.032
  7440-50-8    29   Cu       0.690  0.000  0.690  0.000  0.690  0.000  0.690  0.069
  7440-66-6    30   Zn       0.470  0.000  0.470  0.000  0.470  0.000  0.470  0.047
  7440-38-2    33   As       0.010  0.000  0.010  0.000  0.010  0.000  0.010  0.001
  7726-95-6    35   Br       0.005  0.000  0.005  0.000  0.005  0.000  0.005  0.001
  7439-92-1    82   Pb       0.580  0.000  0.580  0.000  0.580  0.000  0.580  0.058
              200   TC       0.500  0.000  0.500  0.000  0.500  0.000  0.500  0.050
-------------------------------------------------------------------------------
TOTALS:                     56.748        56.748        56.748        56.748
===============================================================================
(1)  No control specified: thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
```

```
PM Profile Speciation Report
-------------------------------------------------------------------------------
Profile Name   : Metal Fabrication - Welding
Profile Number : 25703
Data Quality   : E
-------------------------------------------------------------------------------
Control Device : Uncontrolled(1)
Reference(s)   : 1,32
Data Source    : Data taken from Reference 1. For details, consult Reference
                 32.

SCC Assignments: 034

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :      0.820         0.890          0.920
-------------------------------------------------------------------------------
Total Particulate Matter -
                                                                         Total
                                  0-2.5 um    2.5-10 um(2)   0-10 um(2)    Measured(2)
                Species          ------------ ------------  ------------  ------------
 CAS Number   Num   Sym           %wt    unc    %wt    unc    %wt    unc    %wt    unc
-------------------------------------------------------------------------------
  7440-09-7    19   K          20.900  2.090 20.900  0.000 20.900  4.234 20.900  0.000
  7440-70-2    20   Ca         19.400  1.940 19.400  0.000 19.400  3.931 19.400  0.000
  7439-96-5    25   Mn          6.280  0.628  6.280  0.000  6.280  1.285  6.280  0.000
  7439-89-6    26   Fe         24.600  2.460 24.600  0.000 24.600  4.980 24.600  0.000
-------------------------------------------------------------------------------
TOTALS:                        71.180        71.180        71.180        71.180
===============================================================================
(1)  No control specified: thus, assumed uncontrolled.
(2)  Estimated / extrapolated.
```

3.9 UNPAVED ROADS

Dust particles can become airborne on unpaved roads by vehicular traffic and wind action can increase the activity. Particulate emissions on unpaved roads can be controlled to some degree by chemical stabilizers.

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```
PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Unpaved Road Dust - Riverside, CA
Profile Number : 41205
Data Quality   : C
------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1
Data Source    : Surface dust sampled, aerosolized, and recollected with a
                 Sierra dichotomous virtual impactor. Analyzed using XRF and
                 flame ionization.

SCC Assignments: 055

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :      0.300         0.590          0.730
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                              0-2.5 um       2.5-10 um      0-10 um     Measured(1)
               Species      ------------   ------------   ------------  ------------
  CAS Number  Num   Sym      %wt    unc     %wt    unc     %wt    unc    %wt    unc
------------------------------------------------------------------------------
  7429-90-5    13   Al      9.890  1.484   9.231  1.385   9.267  1.283   9.267  0.000
  7440-21-3    14   Si     20.360  3.054  19.190  2.878  19.253  2.651  19.253  0.000
  7723-14-0    15   P       0.212  0.043   0.175  0.035   0.177  0.035   0.177  0.000
  7704-34-9    16   S       0.406  0.020   0.332  0.017   0.336  0.037   0.336  0.000
  7782-50-5    17   Cl      0.157  0.008   0.179  0.009   0.177  0.020   0.177  0.000
  7440-09-7    19   K       1.981  0.099   2.227  0.111   2.213  0.176   2.213  0.000
  7440-70-2    20   Ca      2.831  0.142   2.900  0.145   2.897  0.238   2.897  0.000
  7440-32-6    22   Ti      0.529  0.027   0.556  0.029   0.554  0.051   0.554  0.000
  7440-62-2    23   V       0.038  0.006   0.025  0.006   0.026  0.008   0.026  0.000
  7440-47-3    24   Cr      0.024  0.002   0.029  0.002   0.029  0.006   0.029  0.000
  7439-96-5    25   Mn      0.159  0.008   0.150  0.008   0.150  0.019   0.150  0.000
  7439-89-6    26   Fe      5.671  0.286   5.955  0.299   5.940  0.476   5.940  0.000
  7440-02-0    28   Ni      0.009  0.001   0.007  0.001   0.007  0.003   0.007  0.000
  7440-50-8    29   Cu      0.011  0.002   0.007  0.001   0.007  0.003   0.007  0.000
  7440-66-6    30   Zn      0.028  0.002   0.026  0.001   0.027  0.006   0.027  0.000
  7440-55-3    31   Ga      0.003  0.001   0.000  0.003   0.000  0.002   0.000  0.000
  7440-38-2    33   As      0.008  0.003   0.000  0.002   0.000  0.002   0.000  0.000
  7782-49-2    34   Se      0.000  0.001   0.000  0.000   0.000  0.000   0.000  0.000
  7726-95-6    35   Br      0.002  0.001   0.003  0.000   0.003  0.002   0.003  0.000
  7440-17-7    37   Rb      0.007  0.002   0.016  0.001   0.016  0.005   0.016  0.000
  7440-24-6    38   Sr      0.012  0.002   0.028  0.002   0.027  0.006   0.027  0.000
  7440-65-5    39   Y       0.000  0.002   0.006  0.001   0.006  0.003   0.006  0.000
  7440-67-7    40   Zr      0.000  0.011   0.000  0.003   0.000  0.005   0.000  0.000
  7439-98-7    42   Mo      0.000  0.007   0.000  0.001   0.000  0.003   0.000  0.000
  7440-05-3    46   Pd      0.000  0.007   0.000  0.001   0.000  0.003   0.000  0.000
  7440-22-4    47   Ag      0.000  0.009   0.000  0.002   0.000  0.004   0.000  0.000
  7440-43-9    48   Cd      0.000  0.012   0.000  0.002   0.000  0.005   0.000  0.000
  7440-74-6    49   In      0.000  0.014   0.000  0.003   0.000  0.006   0.000  0.000
  7440-31-5    50   Sn      0.000  0.017   0.000  0.003   0.000  0.007   0.000  0.000
  7440-36-0    51   Sb      0.000  0.038   0.000  0.007   0.000  0.016   0.000  0.000
  7440-39-3    56   Ba      0.000  0.071   0.050  0.013   0.048  0.031   0.048  0.000
  7439-91-0    57   La      0.000  0.128   0.000  0.022   0.000  0.055   0.000  0.000
  7439-97-6    80   Hg      0.001  0.001   0.000  0.000   0.000  0.001   0.000  0.000
  7439-92-1    82   Pb      0.013  0.004   0.030  0.002   0.029  0.007   0.029  0.000
------------------------------------------------------------------------------
TOTALS:                    42.352         41.122         41.189         41.189
==============================================================================
(1)  Estimated / extrapolated.
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3.10 PAVED ROADS

Reentrained dust from paved roads consists mostly of sand and soil. Road dust also contains particulates from engine exhaust, wear of bearings and brake linings, and tire abrasion. Particulate emissions are further generated when wind activity is high (>20 kilometers per hour). Emission rates are chiefly affected by volume of traffic, and quantity and size of dust particles.

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PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Paved Road Dust - Pasadena Freeway (CA)
Profile Number : 41111
Data Quality   : C
------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1
Data Source    : Surface dust sampled, aerosolized, and recollected with a
                 Sierra dichotomous virtual impactor. Analyzed using XRF and
                 flame ionization.

SCC Assignments: 113

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :      0.250         0.370          0.440
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                       Total
                                 0-2.5 um      2.5-10 um     0-10 um      Measured(1)
                   Species     ------------  ------------  ------------  ------------
 CAS Number  Num   Sym           %wt    unc    %wt    unc    %wt    unc    %wt    unc
------------------------------------------------------------------------------
  7429-90-5   13   Al          6.571  0.986  6.920  1.038  6.880  1.170  6.880  0.000
  7440-21-3   14   Si         23.703  3.555 22.315  3.347 22.474  3.964 22.474  0.000
  7723-14-0   15   P           0.059  0.012  0.056  0.011  0.057  0.015  0.057  0.000
  7704-34-9   16   S           0.356  0.018  0.000  0.000  0.041  0.030  0.041  0.000
  7782-50-5   17   Cl          0.025  0.001  0.000  0.000  0.003  0.002  0.003  0.000
  7440-09-7   19   K           0.643  0.032  1.017  0.051  0.974  0.096  0.974  0.000
  7440-70-2   20   Ca          3.149  0.157  4.984  0.249  4.774  0.441  4.774  0.000
  7440-32-6   22   Ti          0.392  0.020  0.493  0.027  0.482  0.055  0.482  0.000
  7440-62-2   23   V           0.025  0.004  0.006  0.006  0.009  0.006  0.009  0.000
  7440-47-3   24   Cr          0.019  0.002  0.022  0.002  0.022  0.006  0.022  0.000
  7439-96-5   25   Mn          0.059  0.003  0.108  0.006  0.102  0.015  0.102  0.000
  7439-89-6   26   Fe          3.704  0.187  5.997  0.302  5.735  0.525  5.735  0.000
  7440-02-0   28   Ni          0.018  0.001  0.020  0.001  0.020  0.006  0.020  0.000
  7440-50-8   29   Cu          0.032  0.002  0.037  0.002  0.036  0.008  0.036  0.000
  7440-66-6   30   Zn          0.571  0.029  0.580  0.029  0.579  0.069  0.579  0.000
  7440-55-3   31   Ga          0.000  0.005  0.001  0.005  0.001  0.005  0.001  0.000
  7440-38-2   33   As          0.005  0.074  0.000  0.084  0.001  0.076  0.001  0.000
  7782-49-2   34   Se          0.000  0.001  0.000  0.001  0.000  0.001  0.000  0.000
  7726-95-6   35   Br          0.004  0.001  0.001  0.001  0.001  0.002  0.001  0.000
  7440-17-7   37   Rb          0.004  0.001  0.009  0.001  0.009  0.004  0.009  0.000
  7440-24-6   38   Sr          0.094  0.005  0.148  0.008  0.142  0.019  0.142  0.000
  7440-65-5   39   Y           0.004  0.004  0.005  0.005  0.005  0.005  0.005  0.000
  7440-67-7   40   Zr          0.009  0.007  0.000  0.009  0.001  0.008  0.001  0.000
  7439-98-7   42   Mo          0.000  0.003  0.000  0.002  0.000  0.002  0.000  0.000
  7440-05-3   46   Pd          0.000  0.003  0.000  0.002  0.000  0.002  0.000  0.000
  7440-22-4   47   Ag          0.000  0.004  0.001  0.002  0.001  0.003  0.001  0.000
  7440-43-9   48   Cd          0.000  0.005  0.003  0.003  0.003  0.004  0.003  0.000
  7440-74-6   49   In          0.000  0.006  0.000  0.003  0.000  0.004  0.000  0.000
  7440-31-5   50   Sn          0.000  0.007  0.000  0.004  0.000  0.005  0.000  0.000
  7440-36-0   51   Sb          0.000  0.015  0.000  0.009  0.000  0.011  0.000  0.000
  7440-39-3   56   Ba          0.000  0.031  0.117  0.019  0.104  0.027  0.104  0.000
  7439-91-0   57   La          0.000  0.054  0.000  0.030  0.000  0.038  0.000  0.000
  7439-97-6   80   Hg          0.000  0.001  0.000  0.001  0.000  0.001  0.000  0.000
  7439-92-1   82   Pb          1.344  0.068  1.526  0.077  1.505  0.162  1.505  0.000
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PM Profile Speciation Report - continued (profile 41111)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um %wt	0-10 um unc	Total Measured(1) %wt	Total Measured(1) unc
	201	OC	17.574	1.597	14.502	71.384	14.854	53.840	14.854	0.000
	202	EC	0.451	0.130	0.401	0.074	0.407	0.105	0.407	0.000
TOTALS:			58.815		59.269		59.222		59.222	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Paved Road Dust - Artesia Freeway (CA)
Profile Number : 41112
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Surface dust sampled, aerosolized, and recollected with a Sierra dichotomous virtual impactor. Analyzed using XRF and flame ionization.

SCC Assignments: 113

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	6.371	0.956	6.460	0.969	6.454	1.111	6.454	0.000
7440-21-3	14	Si	17.995	2.699	17.486	2.623	17.524	3.060	17.524	0.000
7723-14-0	15	P	0.039	0.008	0.035	0.007	0.035	0.011	0.035	0.000
7704-34-9	16	S	0.874	0.044	0.718	0.036	0.730	0.095	0.730	0.000
7782-50-5	17	Cl	0.190	0.010	0.200	0.010	0.199	0.027	0.199	0.000
7440-09-7	19	K	1.242	0.062	1.691	0.085	1.658	0.164	1.658	0.000
7440-70-2	20	Ca	4.081	0.204	4.512	0.226	4.480	0.471	4.480	0.000
7440-32-6	22	Ti	0.544	0.028	0.593	0.033	0.589	0.069	0.589	0.000
7440-62-2	23	V	0.029	0.006	0.002	0.007	0.004	0.007	0.004	0.000
7440-47-3	24	Cr	0.020	0.002	0.020	0.002	0.020	0.006	0.020	0.000
7439-96-5	25	Mn	0.094	0.005	0.122	0.006	0.120	0.018	0.120	0.000
7439-89-6	26	Fe	4.530	0.229	5.534	0.278	5.460	0.548	5.460	0.000
7440-02-0	28	Ni	0.018	0.002	0.019	0.001	0.019	0.006	0.019	0.000
7440-50-8	29	Cu	0.044	0.003	0.034	0.002	0.034	0.008	0.034	0.000
7440-66-6	30	Zn	0.253	0.013	0.195	0.010	0.199	0.030	0.199	0.000
7440-55-3	31	Ga	0.000	0.001	0.001	0.001	0.001	0.002	0.001	0.000
7440-38-2	33	As	0.002	0.016	0.000	0.015	0.000	0.015	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7726-95-6	35	Br	0.008	0.001	0.011	0.001	0.011	0.004	0.011	0.000
7440-17-7	37	Rb	0.006	0.001	0.012	0.001	0.012	0.004	0.012	0.000
7440-24-6	38	Sr	0.072	0.004	0.112	0.006	0.109	0.016	0.109	0.000
7440-65-5	39	Y	0.000	0.002	0.001	0.001	0.001	0.002	0.001	0.000
7440-67-7	40	Zr	0.005	0.009	0.000	0.007	0.000	0.007	0.000	0.000
7439-98-7	42	Mo	0.000	0.005	0.000	0.002	0.000	0.003	0.000	0.000
7440-05-3	46	Pd	0.000	0.005	0.000	0.002	0.000	0.003	0.000	0.000
7440-22-4	47	Ag	0.000	0.007	0.000	0.002	0.000	0.004	0.000	0.000
7440-43-9	48	Cd	0.000	0.008	0.013	0.003	0.012	0.007	0.012	0.000
7440-74-6	49	In	0.000	0.010	0.000	0.004	0.000	0.006	0.000	0.000
7440-31-5	50	Sn	0.000	0.013	0.000	0.005	0.000	0.008	0.000	0.000
7440-36-0	51	Sb	0.000	0.027	0.000	0.010	0.000	0.017	0.000	0.000
7440-39-3	56	Ba	0.052	0.052	0.145	0.020	0.139	0.037	0.139	0.000
7439-91-0	57	La	0.000	0.093	0.000	0.033	0.000	0.058	0.000	0.000
7439-97-6	80	Hg	0.002	0.001	0.000	0.000	0.001	0.001	0.001	0.000
7439-92-1	82	Pb	0.288	0.015	0.278	0.014	0.279	0.037	0.279	0.000
TOTALS:			36.759		38.194		38.090		38.090	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Paved Road Dust - Long Beach Blvd. (CA)
Profile Number : 41113
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Surface dust sampled, aerosolized, and recollected with a Sierra dichotomous virtual impactor. Analyzed using XRF and flame ionization.

SCC Assignments: 113

Mass Fraction Data -			(0-2.5)	(0-6)	(0-10)
	Size Interval (um)	:	(0-2.5)	(0-6)	(0-10)
	Mass Fraction	:	0.250	0.370	0.440

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
			%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	5.611	0.842	5.681	0.852	5.676	0.978	5.676	0.000
7440-21-3	14	Si	17.174	2.576	16.088	2.413	16.165	2.866	16.165	0.000
7723-14-0	15	P	0.250	0.050	0.210	0.042	0.213	0.052	0.213	0.000
7704-34-9	16	S	0.576	0.029	0.531	0.027	0.535	0.067	0.535	0.000
7782-50-5	17	Cl	0.268	0.013	0.258	0.013	0.258	0.035	0.258	0.000
7440-09-7	19	K	1.260	0.063	1.633	0.082	1.606	0.162	1.606	0.000
7440-70-2	20	Ca	3.836	0.192	3.747	0.187	3.753	0.421	3.753	0.000
7440-32-6	22	Ti	0.347	0.018	0.415	0.023	0.410	0.048	0.410	0.000
7440-62-2	23	V	0.028	0.004	0.020	0.006	0.021	0.008	0.021	0.000
7440-47-3	24	Cr	0.024	0.002	0.030	0.002	0.029	0.007	0.029	0.000
7439-96-5	25	Mn	0.091	0.005	0.104	0.005	0.103	0.016	0.103	0.000
7439-89-6	26	Fe	3.967	0.200	4.779	0.240	4.721	0.477	4.721	0.000
7440-02-0	28	Ni	0.014	0.002	0.014	0.001	0.014	0.005	0.014	0.000
7440-50-8	29	Cu	0.025	0.002	0.025	0.001	0.025	0.007	0.025	0.000
7440-66-6	30	Zn	0.306	0.016	0.273	0.014	0.275	0.038	0.275	0.000
7440-55-3	31	Ga	0.000	0.002	0.000	0.002	0.000	0.001	0.000	0.000
7440-38-2	33	As	0.004	0.017	0.000	0.016	0.000	0.015	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7726-95-6	35	Br	0.005	0.002	0.009	0.001	0.009	0.004	0.009	0.000
7440-17-7	37	Rb	0.002	0.002	0.011	0.001	0.010	0.004	0.010	0.000
7440-24-6	38	Sr	0.028	0.003	0.053	0.003	0.051	0.010	0.051	0.000
7440-65-5	39	Y	0.000	0.003	0.000	0.001	0.000	0.002	0.000	0.000
7440-67-7	40	Zr	0.000	0.012	0.014	0.004	0.013	0.009	0.013	0.000
7439-98-7	42	Mo	0.000	0.008	0.000	0.002	0.000	0.005	0.000	0.000
7440-05-3	46	Pd	0.000	0.008	0.000	0.002	0.000	0.005	0.000	0.000
7440-22-4	47	Ag	0.000	0.010	0.000	0.002	0.000	0.006	0.000	0.000
7440-43-9	48	Cd	0.000	0.013	0.000	0.003	0.000	0.008	0.000	0.000
7440-74-6	49	In	0.000	0.016	0.000	0.004	0.000	0.010	0.000	0.000
7440-31-5	50	Sn	0.000	0.020	0.007	0.005	0.006	0.012	0.006	0.000
7440-36-0	51	Sb	0.000	0.043	0.000	0.011	0.000	0.026	0.000	0.000
7440-39-3	56	Ba	0.000	0.081	0.072	0.020	0.067	0.050	0.067	0.000
7439-91-0	57	La	0.000	0.147	0.000	0.035	0.000	0.088	0.000	0.000
7439-97-6	80	Hg	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.302	0.017	0.284	0.014	0.285	0.038	0.285	0.000
TOTALS:			34.118		34.258		34.245		34.245	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Paved Road Dust - Long Beach, CA
Profile Number : 41114
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Surface dust sampled, aerosolized, and recollected with a Sierra dichotomous virtual impactor. Analyzed using XRF and flame ionization.

SCC Assignments: 113

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	5.185	0.778	5.181	0.777	5.181	0.898	5.181	0.000
7440-21-3	14	Si	13.459	2.019	14.306	2.146	14.251	2.405	14.251	0.000
7723-14-0	15	P	0.254	0.051	0.227	0.046	0.229	0.054	0.229	0.000
7704-34-9	16	S	1.002	0.050	0.903	0.045	0.909	0.111	0.909	0.000
7782-50-5	17	Cl	0.406	0.020	0.460	0.023	0.456	0.053	0.456	0.000
7440-09-7	19	K	1.222	0.061	1.551	0.078	1.530	0.156	1.530	0.000
7440-70-2	20	Ca	4.193	0.210	3.929	0.196	3.946	0.453	3.946	0.000
7440-32-6	22	Ti	0.328	0.017	0.404	0.022	0.400	0.047	0.400	0.000
7440-62-2	23	V	0.027	0.004	0.016	0.005	0.017	0.007	0.017	0.000
7440-47-3	24	Cr	0.022	0.002	0.027	0.002	0.027	0.007	0.027	0.000
7439-96-5	25	Mn	0.083	0.005	0.092	0.005	0.092	0.015	0.092	0.000
7439-89-6	26	Fe	3.692	0.187	4.314	0.217	4.274	0.438	4.274	0.000
7440-02-0	28	Ni	0.012	0.002	0.013	0.001	0.013	0.005	0.013	0.000
7440-50-8	29	Cu	0.025	0.002	0.026	0.001	0.026	0.007	0.026	0.000
7440-66-6	30	Zn	0.223	0.012	0.226	0.011	0.225	0.030	0.225	0.000
7440-55-3	31	Ga	0.001	0.001	0.000	0.002	0.000	0.001	0.000	0.000
7440-38-2	33	As	0.008	0.009	0.000	0.009	0.001	0.008	0.001	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.000
7726-95-6	35	Br	0.007	0.002	0.009	0.001	0.008	0.004	0.008	0.000
7440-17-7	37	Rb	0.002	0.002	0.011	0.001	0.010	0.004	0.010	0.000
7440-24-6	38	Sr	0.038	0.003	0.083	0.004	0.081	0.013	0.081	0.000
7440-65-5	39	Y	0.000	0.003	0.000	0.001	0.000	0.002	0.000	0.000
7440-67-7	40	Zr	0.000	0.013	0.015	0.005	0.014	0.010	0.014	0.000
7439-98-7	42	Mo	0.000	0.008	0.000	0.002	0.000	0.005	0.000	0.000
7440-05-3	46	Pd	0.000	0.008	0.000	0.002	0.000	0.005	0.000	0.000
7440-22-4	47	Ag	0.000	0.010	0.000	0.002	0.000	0.006	0.000	0.000
7440-43-9	48	Cd	0.000	0.014	0.008	0.003	0.007	0.009	0.007	0.000
7440-74-6	49	In	0.000	0.017	0.000	0.003	0.000	0.010	0.000	0.000
7440-31-5	50	Sn	0.000	0.021	0.008	0.004	0.008	0.013	0.008	0.000
7440-36-0	51	Sb	0.000	0.046	0.000	0.009	0.000	0.027	0.000	0.000
7440-39-3	56	Ba	0.000	0.086	0.104	0.018	0.097	0.052	0.097	0.000
7439-91-0	57	La	0.000	0.157	0.000	0.029	0.000	0.092	0.000	0.000
7439-97-6	80	Hg	0.000	0.002	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.156	0.010	0.152	0.008	0.153	0.023	0.153	0.000

```
PM Profile Speciation Report  -  continued (profile 41114)
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                       Total
                                 0-2.5 um      2.5-10 um       0-10 um      Measured(1)
                  Species      ------------  ------------  ------------  ------------
 CAS Number   Num   Sym        %wt    unc     %wt    unc    %wt    unc    %wt    unc
--------------------------------------------------------------------------------
              201   OC       19.626  3.184  18.959  1.465  19.002  2.858  19.002  0.000
              202   EC        2.213  0.407   1.188  0.100   1.254  0.311   1.254  0.000
--------------------------------------------------------------------------------
TOTALS:                      52.184         52.212         52.211         52.211
================================================================================
(1)  Estimated / extrapolated.
```

```
PM Profile Speciation Report
----------------------------------------------------------------------------
Profile Name   : Paved Road Dust - La Cienega Blvd. (CA)
Profile Number : 41115
Data Quality   : C
----------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1
Data Source    : Surface dust sampled, aerosolized, and recollected with a
                 Sierra dichotomous virtual impactor. Analyzed using XRF and
                 flame ionization.

SCC Assignments: 113

Mass Fraction Data -  Size Interval (um) :    (0-2.5)       (0-6)        (0-10)
                      Mass Fraction      :     0.250        0.370         0.440
----------------------------------------------------------------------------
Total Particulate Matter -
                                                                  Total
                                0-2.5 um     2.5-10 um     0-10 um     Measured(1)
               Species        ------------  ------------  ------------  ------------
 CAS Number   Num   Sym        %wt    unc    %wt    unc    %wt    unc    %wt    unc
----------------------------------------------------------------------------
 7429-90-5    13    Al        5.837  0.876  8.096  1.214  7.957  1.236  7.957  0.000
 7440-21-3    14    Si       14.851  2.228 20.769  3.115 20.406  3.156 20.406  0.000
 7723-14-0    15    P         0.023  0.005  0.028  0.006  0.028  0.008  0.028  0.000
 7704-34-9    16    S         0.220  0.011  0.184  0.009  0.186  0.028  0.186  0.000
 7782-50-5    17    Cl        0.067  0.003  0.059  0.003  0.059  0.012  0.059  0.000
 7440-09-7    19    K         0.915  0.046  1.698  0.085  1.650  0.148  1.650  0.000
 7440-70-2    20    Ca        1.622  0.081  2.336  0.117  2.292  0.219  2.292  0.000
 7440-32-6    22    Ti        0.308  0.016  0.517  0.028  0.504  0.052  0.504  0.000
 7440-62-2    23    V         0.017  0.004  0.011  0.006  0.011  0.007  0.011  0.000
 7440-47-3    24    Cr        0.009  0.001  0.018  0.002  0.018  0.005  0.018  0.000
 7439-96-5    25    Mn        0.063  0.004  0.111  0.006  0.108  0.016  0.108  0.000
 7439-89-6    26    Fe        3.268  0.165  5.302  0.267  5.177  0.465  5.177  0.000
 7440-02-0    28    Ni        0.007  0.001  0.011  0.001  0.011  0.004  0.011  0.000
 7440-50-8    29    Cu        0.010  0.001  0.013  0.001  0.013  0.005  0.013  0.000
 7440-66-6    30    Zn        0.046  0.003  0.062  0.003  0.061  0.011  0.061  0.000
 7440-55-3    31    Ga        0.000  0.001  0.000  0.000  0.000  0.000  0.000  0.000
 7440-38-2    33    As        0.003  0.002  0.000  0.003  0.000  0.003  0.000  0.000
 7782-49-2    34    Se        0.000  0.001  0.000  0.000  0.000  0.000  0.000  0.000
 7726-95-6    35    Br        0.002  0.001  0.004  0.000  0.004  0.003  0.004  0.000
 7440-17-7    37    Rb        0.003  0.001  0.014  0.001  0.013  0.005  0.013  0.000
 7440-24-6    38    Sr        0.014  0.002  0.040  0.002  0.038  0.008  0.038  0.000
 7440-65-5    39    Y         0.000  0.002  0.001  0.001  0.001  0.001  0.001  0.000
 7440-67-7    40    Zr        0.000  0.007  0.005  0.004  0.005  0.006  0.005  0.000
 7439-98-7    42    Mo        0.000  0.005  0.000  0.002  0.000  0.003  0.000  0.000
 7440-05-3    46    Pd        0.000  0.004  0.000  0.002  0.000  0.003  0.000  0.000
 7440-22-4    47    Ag        0.000  0.006  0.000  0.002  0.000  0.004  0.000  0.000
 7440-43-9    48    Cd        0.000  0.008  0.000  0.003  0.000  0.005  0.000  0.000
 7440-74-6    49    In        0.000  0.010  0.000  0.003  0.000  0.006  0.000  0.000
 7440-31-5    50    Sn        0.000  0.011  0.004  0.004  0.004  0.008  0.004  0.000
 7440-36-0    51    Sb        0.000  0.025  0.005  0.009  0.005  0.016  0.005  0.000
 7440-39-3    56    Ba        0.000  0.048  0.099  0.018  0.093  0.033  0.093  0.000
 7439-91-0    57    La        0.000  0.087  0.000  0.029  0.000  0.054  0.000  0.000
 7439-97-6    80    Hg        0.000  0.001  0.000  0.000  0.000  0.001  0.000  0.000
 7439-92-1    82    Pb        0.026  0.003  0.049  0.003  0.048  0.009  0.048  0.000
----------------------------------------------------------------------------
TOTALS:                      27.311        39.436        38.692        38.692
============================================================================
(1)  Estimated / extrapolated.
```

```
PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Paved Road Dust - Hawthorne, CA
Profile Number : 41116
Data Quality   : C
--------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1
Data Source    : Surface dust sampled, aerosolized, and recollected with a
                 Sierra dichotomous virtual impactor. Analyzed using XRF and
                 flame ionization.

SCC Assignments: 113

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.250         0.370           0.440
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                          Total
                                0-2.5 um       2.5-10 um       0-10 um     Measured(1)
                  Species     ------------   ------------   ------------   ------------
 CAS Number   Num   Sym        %wt    unc     %wt    unc     %wt    unc     %wt    unc
--------------------------------------------------------------------------------
  7429-90-5   13    Al        6.146  0.922   5.810  0.872   5.830  1.033   5.830  0.000
  7440-21-3   14    Si       17.411  2.612  15.633  2.345  15.739  2.845  15.739  0.000
  7723-14-0   15    P         0.040  0.008   0.031  0.006   0.032  0.010   0.032  0.000
  7704-34-9   16    S         0.648  0.032   0.398  0.020   0.413  0.066   0.413  0.000
  7782-50-5   17    Cl        0.130  0.007   0.134  0.007   0.134  0.020   0.134  0.000
  7440-09-7   19    K         1.080  0.054   1.414  0.071   1.394  0.141   1.394  0.000
  7440-70-2   20    Ca        2.864  0.143   2.618  0.131   2.633  0.308   2.633  0.000
  7440-32-6   22    Ti        0.326  0.017   0.408  0.023   0.403  0.047   0.403  0.000
  7440-62-2   23    V         0.024  0.004   0.009  0.005   0.010  0.006   0.010  0.000
  7440-47-3   24    Cr        0.018  0.002   0.017  0.002   0.017  0.005   0.017  0.000
  7439-96-5   25    Mn        0.076  0.004   0.101  0.005   0.100  0.015   0.100  0.000
  7439-89-6   26    Fe        3.530  0.178   4.245  0.214   4.202  0.425   4.202  0.000
  7440-02-0   28    Ni        0.016  0.002   0.013  0.001   0.013  0.005   0.013  0.000
  7440-50-8   29    Cu        0.031  0.002   0.020  0.001   0.021  0.006   0.021  0.000
  7440-66-6   30    Zn        0.164  0.009   0.162  0.008   0.162  0.023   0.162  0.000
  7440-55-3   31    Ga        0.000  0.001   0.000  0.001   0.000  0.001   0.000  0.000
  7440-38-2   33    As        0.004  0.011   0.000  0.007   0.000  0.008   0.000  0.000
  7782-49-2   34    Se        0.000  0.001   0.000  0.000   0.000  0.000   0.000  0.000
  7726-95-6   35    Br        0.008  0.001   0.008  0.001   0.008  0.004   0.008  0.000
  7440-17-7   37    Rb        0.004  0.001   0.012  0.001   0.011  0.004   0.011  0.000
  7440-24-6   38    Sr        0.044  0.003   0.076  0.004   0.074  0.012   0.074  0.000
  7440-65-5   39    Y         0.000  0.002   0.001  0.001   0.001  0.002   0.001  0.000
  7440-67-7   40    Zr        0.000  0.009   0.008  0.005   0.007  0.007   0.007  0.000
  7439-98-7   42    Mo        0.000  0.006   0.000  0.002   0.000  0.004   0.000  0.000
  7440-05-3   46    Pd        0.000  0.005   0.000  0.002   0.000  0.003   0.000  0.000
  7440-22-4   47    Ag        0.000  0.007   0.000  0.002   0.000  0.004   0.000  0.000
  7440-43-9   48    Cd        0.000  0.009   0.000  0.003   0.000  0.006   0.000  0.000
  7440-74-6   49    In        0.000  0.011   0.000  0.004   0.000  0.007   0.000  0.000
  7440-31-5   50    Sn        0.000  0.014   0.000  0.005   0.000  0.008   0.000  0.000
  7440-36-0   51    Sb        0.000  0.030   0.000  0.010   0.000  0.018   0.000  0.000
  7440-39-3   56    Ba        0.000  0.056   0.085  0.019   0.080  0.037   0.080  0.000
  7439-91-0   57    La        0.000  0.102   0.004  0.032   0.003  0.063   0.003  0.000
  7439-97-6   80    Hg        0.000  0.001   0.000  0.000   0.000  0.001   0.000  0.000
  7439-92-1   82    Pb        0.180  0.010   0.132  0.007   0.135  0.023   0.135  0.000
--------------------------------------------------------------------------------
TOTALS:                      32.744         31.339         31.422         31.422
================================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Paved Road Dust - Victory Blvd. (CA)
Profile Number : 41117
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Surface dust sampled, aerosolized, and recollected with a Sierra dichotomous virtual impactor. Analyzed using XRF and flame ionization.

SCC Assignments: 113

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	4.062	0.609	4.913	0.737	4.880	0.787	4.880	0.000
7440-21-3	14	Si	12.435	1.865	13.602	2.040	13.557	2.259	13.557	0.000
7723-14-0	15	P	0.325	0.065	0.283	0.057	0.284	0.067	0.284	0.000
7704-34-9	16	S	0.864	0.043	0.700	0.035	0.707	0.093	0.707	0.000
7782-50-5	17	Cl	0.368	0.018	0.389	0.019	0.388	0.047	0.388	0.000
7440-09-7	19	K	0.836	0.042	1.332	0.067	1.312	0.123	1.312	0.000
7440-70-2	20	Ca	3.941	0.197	4.986	0.249	4.946	0.485	4.946	0.000
7440-32-6	22	Ti	0.331	0.017	0.441	0.023	0.437	0.049	0.437	0.000
7440-62-2	23	V	0.022	0.004	0.020	0.005	0.020	0.007	0.020	0.000
7440-47-3	24	Cr	0.023	0.002	0.031	0.002	0.031	0.007	0.031	0.000
7439-96-5	25	Mn	0.067	0.004	0.092	0.005	0.091	0.014	0.091	0.000
7439-89-6	26	Fe	3.538	0.179	4.618	0.232	4.576	0.444	4.576	0.000
7440-02-0	28	Ni	0.011	0.001	0.013	0.001	0.013	0.005	0.013	0.000
7440-50-8	29	Cu	0.041	0.003	0.040	0.002	0.040	0.009	0.040	0.000
7440-66-6	30	Zn	0.267	0.014	0.275	0.014	0.275	0.036	0.275	0.000
7440-55-3	31	Ga	0.001	0.002	0.000	0.001	0.000	0.001	0.000	0.000
7440-38-2	33	As	0.009	0.016	0.000	0.018	0.000	0.017	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7726-95-6	35	Br	0.008	0.001	0.012	0.001	0.012	0.004	0.012	0.000
7440-17-7	37	Rb	0.000	0.002	0.010	0.001	0.010	0.004	0.010	0.000
7440-24-6	38	Sr	0.019	0.002	0.054	0.003	0.052	0.010	0.052	0.000
7440-65-5	39	Y	0.000	0.003	0.000	0.001	0.000	0.002	0.000	0.000
7440-67-7	40	Zr	0.000	0.011	0.009	0.004	0.009	0.008	0.009	0.000
7439-98-7	42	Mo	0.000	0.006	0.003	0.002	0.003	0.004	0.003	0.000
7440-05-3	46	Pd	0.000	0.006	0.000	0.001	0.000	0.004	0.000	0.000
7440-22-4	47	Ag	0.000	0.009	0.000	0.002	0.000	0.005	0.000	0.000
7440-43-9	48	Cd	0.000	0.011	0.000	0.002	0.000	0.007	0.000	0.000
7440-74-6	49	In	0.000	0.014	0.000	0.003	0.000	0.008	0.000	0.000
7440-31-5	50	Sn	0.000	0.017	0.000	0.004	0.000	0.010	0.000	0.000
7440-36-0	51	Sb	0.000	0.037	0.000	0.008	0.000	0.022	0.000	0.000
7440-39-3	56	Ba	0.000	0.070	0.081	0.015	0.078	0.043	0.078	0.000
7439-91-0	57	La	0.000	0.125	0.000	0.026	0.000	0.074	0.000	0.000
7439-97-6	80	Hg	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.281	0.015	0.334	0.017	0.332	0.040	0.332	0.000
TOTALS:			27.449		32.238		32.053		32.053	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Paved Road Dust - Burbank, CA
Profile Number : 41118
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Surface dust sampled, aerosolized, and recollected with a Sierra dichotomous virtual impactor. Analyzed using XRF and flame ionization.

SCC Assignments: 113

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	4.511	0.677	5.034	0.755	5.002	0.832	5.002	0.000
7440-21-3	14	Si	12.666	1.900	14.087	2.113	14.000	2.324	14.000	0.000
7723-14-0	15	P	0.223	0.045	0.213	0.043	0.214	0.049	0.214	0.000
7704-34-9	16	S	0.872	0.044	0.703	0.035	0.713	0.094	0.713	0.000
7782-50-5	17	Cl	0.348	0.017	0.355	0.018	0.355	0.044	0.355	0.000
7440-09-7	19	K	0.918	0.046	1.352	0.068	1.326	0.129	1.326	0.000
7440-70-2	20	Ca	5.542	0.277	5.732	0.287	5.721	0.620	5.721	0.000
7440-32-6	22	Ti	0.334	0.018	0.432	0.023	0.426	0.048	0.426	0.000
7440-62-2	23	V	0.021	0.004	0.020	0.006	0.020	0.007	0.020	0.000
7440-47-3	24	Cr	0.020	0.002	0.027	0.002	0.026	0.007	0.026	0.000
7439-96-5	25	Mn	0.076	0.005	0.095	0.005	0.094	0.015	0.094	0.000
7439-89-6	26	Fe	3.319	0.168	4.280	0.215	4.221	0.414	4.221	0.000
7440-02-0	28	Ni	0.009	0.002	0.013	0.001	0.013	0.005	0.013	0.000
7440-50-8	29	Cu	0.025	0.002	0.026	0.002	0.026	0.007	0.026	0.000
7440-66-6	30	Zn	0.217	0.012	0.215	0.011	0.216	0.029	0.216	0.000
7440-55-3	31	Ga	0.001	0.001	0.000	0.002	0.000	0.002	0.000	0.000
7440-38-2	33	As	0.005	0.011	0.000	0.013	0.000	0.011	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7726-95-6	35	Br	0.004	0.002	0.009	0.001	0.008	0.004	0.008	0.000
7440-17-7	37	Rb	0.000	0.002	0.010	0.001	0.010	0.004	0.010	0.000
7440-24-6	38	Sr	0.028	0.003	0.051	0.003	0.049	0.010	0.049	0.000
7440-65-5	39	Y	0.000	0.003	0.000	0.001	0.000	0.002	0.000	0.000
7440-67-7	40	Zr	0.000	0.012	0.000	0.004	0.000	0.008	0.000	0.000
7439-98-7	42	Mo	0.000	0.007	0.000	0.002	0.000	0.004	0.000	0.000
7440-05-3	46	Pd	0.000	0.008	0.000	0.002	0.000	0.004	0.000	0.000
7440-22-4	47	Ag	0.000	0.010	0.000	0.002	0.000	0.006	0.000	0.000
7440-43-9	48	Cd	0.000	0.013	0.011	0.003	0.010	0.009	0.010	0.000
7440-74-6	49	In	0.000	0.016	0.000	0.004	0.000	0.010	0.000	0.000
7440-31-5	50	Sn	0.000	0.019	0.013	0.005	0.012	0.012	0.012	0.000
7440-36-0	51	Sb	0.000	0.043	0.000	0.010	0.000	0.025	0.000	0.000
7440-39-3	56	Ba	0.000	0.080	0.067	0.019	0.062	0.048	0.062	0.000
7439-91-0	57	La	0.000	0.145	0.000	0.032	0.000	0.086	0.000	0.000
7439-97-6	80	Hg	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.181	0.011	0.225	0.012	0.223	0.028	0.223	0.000

```
PM Profile Speciation Report  -  continued (profile 41118)
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                       Total
                                0-2.5 um      2.5-10 um       0-10 um     Measured(1)
                Species       ------------  ------------  ------------  ------------
 CAS Number  Num   Sym         %wt    unc    %wt    unc    %wt    unc    %wt    unc
--------------------------------------------------------------------------------
             201   OC        10.647  1.669  15.978  2.162  15.651  2.266  15.651  0.000
             202   EC         0.999  0.207   1.778  0.225   1.730  0.248   1.730  0.000
--------------------------------------------------------------------------------
TOTALS:                      40.966         50.726         50.128         50.128
================================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Paved Road Dust - North Main St., Los Angeles, CA
Profile Number : 41119
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Surface dust sampled, aerosolized, and recollected with a Sierra dichotomous virtual impactor. Analyzed using XRF and flame ionization.

SCC Assignments: 113

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	2.893	0.434	3.734	0.560	3.689	0.586	3.689	0.000
7440-21-3	14	Si	9.439	1.416	10.987	1.648	10.905	1.781	10.905	0.000
7723-14-0	15	P	0.524	0.105	0.496	0.099	0.498	0.111	0.498	0.000
7704-34-9	16	S	0.852	0.043	0.782	0.039	0.785	0.096	0.785	0.000
7782-50-5	17	Cl	0.352	0.018	0.428	0.021	0.424	0.049	0.424	0.000
7440-09-7	19	K	0.663	0.033	1.107	0.055	1.084	0.102	1.084	0.000
7440-70-2	20	Ca	3.609	0.180	4.405	0.220	4.363	0.437	4.363	0.000
7440-32-6	22	Ti	0.258	0.014	0.354	0.020	0.349	0.040	0.349	0.000
7440-62-2	23	V	0.025	0.004	0.019	0.005	0.019	0.007	0.019	0.000
7440-47-3	24	Cr	0.031	0.002	0.039	0.002	0.039	0.008	0.039	0.000
7439-96-5	25	Mn	0.078	0.005	0.089	0.005	0.088	0.014	0.088	0.000
7439-89-6	26	Fe	7.120	0.359	6.131	0.308	6.184	0.744	6.184	0.000
7440-02-0	28	Ni	0.011	0.002	0.013	0.001	0.012	0.004	0.012	0.000
7440-50-8	29	Cu	0.050	0.003	0.059	0.003	0.059	0.011	0.059	0.000
7440-66-6	30	Zn	0.398	0.021	0.437	0.022	0.435	0.052	0.435	0.000
7440-55-3	31	Ga	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.000
7440-38-2	33	As	0.006	0.008	0.000	0.010	0.000	0.009	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7726-95-6	35	Br	0.002	0.001	0.006	0.001	0.006	0.003	0.006	0.000
7440-17-7	37	Rb	0.000	0.002	0.009	0.001	0.008	0.004	0.008	0.000
7440-24-6	38	Sr	0.030	0.003	0.084	0.004	0.081	0.013	0.081	0.000
7440-65-5	39	Y	0.000	0.002	0.000	0.001	0.000	0.002	0.000	0.000
7440-67-7	40	Zr	0.000	0.012	0.013	0.005	0.012	0.009	0.012	0.000
7439-98-7	42	Mo	0.000	0.007	0.004	0.002	0.003	0.005	0.003	0.000
7440-05-3	46	Pd	0.000	0.007	0.000	0.002	0.000	0.004	0.000	0.000
7440-22-4	47	Ag	0.000	0.009	0.000	0.002	0.000	0.005	0.000	0.000
7440-43-9	48	Cd	0.000	0.012	0.000	0.003	0.000	0.007	0.000	0.000
7440-74-6	49	In	0.000	0.014	0.000	0.003	0.000	0.009	0.000	0.000
7440-31-5	50	Sn	0.000	0.017	0.012	0.004	0.012	0.011	0.012	0.000
7440-36-0	51	Sb	0.000	0.039	0.000	0.009	0.000	0.023	0.000	0.000
7440-39-3	56	Ba	0.000	0.073	0.091	0.018	0.086	0.045	0.086	0.000
7439-91-0	57	La	0.000	0.130	0.000	0.030	0.000	0.077	0.000	0.000
7439-97-6	80	Hg	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.137	0.009	0.175	0.009	0.173	0.023	0.173	0.000

```
PM Profile Speciation Report  -  continued (profile 41119)
-------------------------------------------------------------------------------
Total Particulate Matter -
                                                                  Total
                               0-2.5 um      2.5-10 um      0-10 um      Measured(1)
                 Species     ------------  ------------  ------------  ------------
CAS Number  Num   Sym         %wt    unc    %wt    unc    %wt    unc    %wt    unc
-------------------------------------------------------------------------------
            201   OC       19.267  5.454 21.522  1.630 21.403  3.877 21.403  0.000
            202   EC        0.858  0.429  1.718  0.137  1.672  0.295  1.672  0.000
-------------------------------------------------------------------------------
TOTALS:                    46.604        52.714        52.389        52.389
===============================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Paved Road Dust - Los Angeles, CA
Profile Number : 41120
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Surface dust sampled, aerosolized, and recollected with a Sierra dichotomous virtual impactor. Analyzed using XRF and flame ionization.

SCC Assignments: 113

Mass Fraction Data -				
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

			0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
	Species									
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	4.456	0.669	4.859	0.729	4.843	0.811	4.843	0.000
7440-21-3	14	Si	10.398	1.560	11.889	1.783	11.827	1.940	11.827	0.000
7723-14-0	15	P	0.223	0.045	0.224	0.045	0.224	0.051	0.224	0.000
7704-34-9	16	S	0.943	0.047	0.838	0.042	0.843	0.104	0.843	0.000
7782-50-5	17	Cl	0.270	0.014	0.300	0.015	0.299	0.037	0.299	0.000
7440-09-7	19	K	0.641	0.032	1.059	0.053	1.041	0.098	1.041	0.000
7440-70-2	20	Ca	2.877	0.144	3.715	0.186	3.680	0.360	3.680	0.000
7440-32-6	22	Ti	0.352	0.019	0.560	0.029	0.552	0.057	0.552	0.000
7440-62-2	23	V	0.031	0.005	0.033	0.007	0.033	0.009	0.033	0.000
7440-47-3	24	Cr	0.066	0.004	0.103	0.005	0.101	0.015	0.101	0.000
7439-96-5	25	Mn	0.077	0.005	0.080	0.004	0.080	0.014	0.080	0.000
7439-89-6	26	Fe	3.301	0.167	4.621	0.232	4.566	0.431	4.566	0.000
7440-02-0	28	Ni	0.048	0.003	0.070	0.004	0.069	0.012	0.069	0.000
7440-50-8	29	Cu	0.056	0.004	0.061	0.003	0.061	0.011	0.061	0.000
7440-66-6	30	Zn	0.458	0.024	0.426	0.021	0.427	0.055	0.427	0.000
7440-55-3	31	Ga	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.000
7440-38-2	33	As	0.014	0.016	0.000	0.017	0.001	0.016	0.001	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7726-95-6	35	Br	0.002	0.002	0.006	0.001	0.006	0.003	0.006	0.000
7440-17-7	37	Rb	0.000	0.002	0.009	0.001	0.008	0.004	0.008	0.000
7440-24-6	38	Sr	0.012	0.003	0.066	0.003	0.064	0.011	0.064	0.000
7440-65-5	39	Y	0.000	0.003	0.000	0.001	0.000	0.002	0.000	0.000
7440-67-7	40	Zr	0.000	0.014	0.005	0.005	0.005	0.009	0.005	0.000
7439-98-7	42	Mo	0.000	0.008	0.016	0.003	0.015	0.007	0.015	0.000
7440-05-3	46	Pd	0.000	0.008	0.000	0.002	0.000	0.005	0.000	0.000
7440-22-4	47	Ag	0.000	0.010	0.000	0.002	0.000	0.006	0.000	0.000
7440-43-9	48	Cd	0.000	0.014	0.000	0.003	0.000	0.008	0.000	0.000
7440-74-6	49	In	0.000	0.017	0.000	0.004	0.000	0.010	0.000	0.000
7440-31-5	50	Sn	0.000	0.021	0.007	0.004	0.007	0.013	0.007	0.000
7440-36-0	51	Sb	0.000	0.046	0.000	0.009	0.000	0.027	0.000	0.000
7440-39-3	56	Ba	0.000	0.085	0.050	0.019	0.048	0.051	0.048	0.000
7439-91-0	57	La	0.000	0.157	0.000	0.032	0.000	0.092	0.000	0.000
7439-97-6	80	Hg	0.000	0.002	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.282	0.016	0.307	0.016	0.306	0.038	0.306	0.000
TOTALS:			24.507		29.304		29.106		29.106	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Paved Road Dust - South Harbor Blvd., Anaheim, CA
Profile Number : 41121
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Surface dust sampled, aerosolized, and recollected with a Sierra dichotomous virtual impactor. Analyzed using XRF and flame ionization.

SCC Assignments: 113

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	3.821	0.573	3.720	0.558	3.726	0.654	3.726	0.000
7440-21-3	14	Si	10.645	1.597	11.378	1.707	11.337	1.909	11.337	0.000
7723-14-0	15	P	0.191	0.038	0.185	0.037	0.186	0.043	0.186	0.000
7704-34-9	16	S	1.209	0.060	1.237	0.062	1.235	0.140	1.235	0.000
7782-50-5	17	Cl	0.818	0.041	0.797	0.040	0.798	0.095	0.798	0.000
7440-09-7	19	K	0.847	0.042	1.320	0.066	1.293	0.123	1.293	0.000
7440-70-2	20	Ca	3.108	0.155	3.864	0.193	3.822	0.381	3.822	0.000
7440-32-6	22	Ti	0.188	0.011	0.288	0.017	0.283	0.033	0.283	0.000
7440-62-2	23	V	0.017	0.003	0.015	0.005	0.015	0.006	0.015	0.000
7440-47-3	24	Cr	0.023	0.002	0.036	0.002	0.035	0.008	0.035	0.000
7439-96-5	25	Mn	0.050	0.004	0.073	0.004	0.072	0.012	0.072	0.000
7439-89-6	26	Fe	2.268	0.115	3.416	0.172	3.353	0.311	3.353	0.000
7440-02-0	28	Ni	0.008	0.002	0.012	0.001	0.011	0.004	0.011	0.000
7440-50-8	29	Cu	0.041	0.003	0.017	0.001	0.018	0.006	0.018	0.000
7440-66-6	30	Zn	0.220	0.012	0.178	0.009	0.181	0.028	0.181	0.000
7440-55-3	31	Ga	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.000
7440-38-2	33	As	0.002	0.008	0.000	0.009	0.000	0.008	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7726-95-6	35	Br	0.007	0.002	0.011	0.001	0.011	0.004	0.011	0.000
7440-17-7	37	Rb	0.000	0.002	0.011	0.001	0.011	0.004	0.011	0.000
7440-24-6	38	Sr	0.081	0.005	0.132	0.007	0.129	0.018	0.129	0.000
7440-65-5	39	Y	0.000	0.003	0.000	0.001	0.000	0.002	0.000	0.000
7440-67-7	40	Zr	0.000	0.015	0.015	0.008	0.014	0.011	0.014	0.000
7439-98-7	42	Mo	0.000	0.009	0.000	0.002	0.000	0.005	0.000	0.000
7440-05-3	46	Pd	0.000	0.009	0.004	0.002	0.003	0.006	0.003	0.000
7440-22-4	47	Ag	0.000	0.012	0.005	0.002	0.004	0.007	0.004	0.000
7440-43-9	48	Cd	0.000	0.015	0.005	0.003	0.005	0.009	0.005	0.000
7440-74-6	49	In	0.000	0.019	0.000	0.004	0.000	0.011	0.000	0.000
7440-31-5	50	Sn	0.000	0.023	0.008	0.005	0.008	0.014	0.008	0.000
7440-36-0	51	Sb	0.000	0.050	0.000	0.010	0.000	0.030	0.000	0.000
7440-39-3	56	Ba	0.000	0.094	0.108	0.020	0.102	0.057	0.102	0.000
7439-91-0	57	La	0.000	0.171	0.000	0.033	0.000	0.100	0.000	0.000
7439-97-6	80	Hg	0.000	0.002	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.126	0.009	0.169	0.009	0.167	0.022	0.167	0.000
TOTALS:			23.670		27.004		26.819		26.819	

(1) Estimated / extrapolated.

```
PM Profile Speciation Report
----------------------------------------------------------------------------
Profile Name   : Paved Road Dust - Anaheim, CA
Profile Number : 41122
Data Quality   : C
----------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1
Data Source    : Surface dust sampled, aerosolized, and recollected with a
                 Sierra dichotomous virtual impactor. Analyzed using XRF and
                 flame ionization.

SCC Assignments: 113

Mass Fraction Data -  Size Interval (um) :    (0-2.5)       (0-6)        (0-10)
                      Mass Fraction      :     0.250        0.370         0.440
----------------------------------------------------------------------------
Total Particulate Matter -
                                                                     Total
                                0-2.5 um      2.5-10 um      0-10 um     Measured(1)
                  Species     ------------  ------------  ------------  ------------
  CAS Number   Num   Sym       %wt    unc     %wt    unc     %wt    unc    %wt    unc
----------------------------------------------------------------------------
  7429-90-5    13    Al       4.994  0.749   5.259  0.789   5.243  0.890   5.243  0.000
  7440-21-3    14    Si      14.029  2.104  14.421  2.163  14.397  2.460  14.397  0.000
  7723-14-0    15    P        0.290  0.058   0.237  0.047   0.240  0.059   0.240  0.000
  7704-34-9    16    S        0.941  0.047   0.899  0.045   0.902  0.107   0.902  0.000
  7782-50-5    17    Cl       0.412  0.021   0.414  0.021   0.414  0.051   0.414  0.000
  7440-09-7    19    K        1.073  0.054   1.461  0.073   1.438  0.143   1.438  0.000
  7440-70-2    20    Ca       4.890  0.244   5.325  0.266   5.299  0.560   5.299  0.000
  7440-32-6    22    Ti       0.338  0.018   0.424  0.022   0.419  0.048   0.419  0.000
  7440-62-2    23    V        0.024  0.004   0.020  0.005   0.021  0.007   0.021  0.000
  7440-47-3    24    Cr       0.022  0.002   0.026  0.002   0.026  0.007   0.026  0.000
  7439-96-5    25    Mn       0.098  0.005   0.107  0.005   0.107  0.017   0.107  0.000
  7439-89-6    26    Fe       3.550  0.179   4.306  0.217   4.261  0.429   4.261  0.000
  7440-02-0    28    Ni       0.015  0.001   0.015  0.001   0.015  0.005   0.015  0.000
  7440-50-8    29    Cu       0.023  0.002   0.021  0.001   0.021  0.006   0.021  0.000
  7440-66-6    30    Zn       0.202  0.010   0.196  0.010   0.196  0.027   0.196  0.000
  7440-55-3    31    Ga       0.000  0.001   0.000  0.002   0.000  0.002   0.000  0.000
  7440-38-2    33    As       0.005  0.010   0.000  0.010   0.000  0.009   0.000  0.000
  7782-49-2    34    Se       0.000  0.001   0.000  0.000   0.000  0.000   0.000  0.000
  7726-95-6    35    Br       0.005  0.001   0.007  0.001   0.007  0.003   0.007  0.000
  7440-17-7    37    Rb       0.001  0.001   0.011  0.001   0.011  0.004   0.011  0.000
  7440-24-6    38    Sr       0.035  0.002   0.058  0.003   0.056  0.010   0.056  0.000
  7440-65-5    39    Y        0.000  0.002   0.000  0.001   0.000  0.001   0.000  0.000
  7440-67-7    40    Zr       0.000  0.007   0.010  0.004   0.009  0.006   0.009  0.000
  7439-98-7    42    Mo       0.000  0.004   0.003  0.001   0.003  0.003   0.003  0.000
  7440-05-3    46    Pd       0.000  0.004   0.000  0.001   0.000  0.003   0.000  0.000
  7440-22-4    47    Ag       0.000  0.005   0.000  0.002   0.000  0.003   0.000  0.000
  7440-43-9    48    Cd       0.000  0.007   0.004  0.002   0.004  0.005   0.004  0.000
  7440-74-6    49    In       0.000  0.008   0.000  0.003   0.000  0.005   0.000  0.000
  7440-31-5    50    Sn       0.000  0.010   0.006  0.003   0.006  0.007   0.006  0.000
  7440-36-0    51    Sb       0.000  0.023   0.000  0.007   0.000  0.014   0.000  0.000
  7440-39-3    56    Ba       0.000  0.042   0.017  0.014   0.016  0.027   0.016  0.000
  7439-91-0    57    La       0.000  0.076   0.000  0.023   0.000  0.047   0.000  0.000
  7439-97-6    80    Hg       0.000  0.001   0.001  0.000   0.001  0.001   0.001  0.000
  7439-92-1    82    Pb       0.167  0.009   0.174  0.009   0.174  0.024   0.174  0.000
----------------------------------------------------------------------------
TOTALS:                      31.114         33.422         33.286         33.286
============================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Paved Road Dust - Riverside, CA
Profile Number : 41123
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Surface dust sampled, aerosolized, and recollected with a Sierra dichotomous virtual impactor. Analyzed using XRF and flame ionization.

SCC Assignments: 113

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	8.320	1.248	7.123	1.068	7.213	1.331	7.213	0.000
7440-21-3	14	Si	18.597	2.790	16.470	2.471	16.630	3.019	16.630	0.000
7723-14-0	15	P	0.228	0.046	0.187	0.037	0.190	0.047	0.190	0.000
7704-34-9	16	S	0.739	0.037	0.555	0.028	0.569	0.079	0.569	0.000
7782-50-5	17	Cl	0.241	0.012	0.232	0.012	0.233	0.032	0.233	0.000
7440-09-7	19	K	1.667	0.083	1.913	0.096	1.894	0.200	1.894	0.000
7440-70-2	20	Ca	3.793	0.190	3.590	0.180	3.605	0.412	3.605	0.000
7440-32-6	22	Ti	0.458	0.024	0.496	0.026	0.493	0.058	0.493	0.000
7440-62-2	23	V	0.028	0.005	0.022	0.006	0.023	0.008	0.023	0.000
7440-47-3	24	Cr	0.025	0.002	0.027	0.002	0.027	0.007	0.027	0.000
7439-96-5	25	Mn	0.117	0.006	0.119	0.006	0.119	0.018	0.119	0.000
7439-89-6	26	Fe	4.789	0.241	5.117	0.257	5.093	0.544	5.093	0.000
7440-02-0	28	Ni	0.008	0.001	0.008	0.001	0.008	0.004	0.008	0.000
7440-50-8	29	Cu	0.010	0.001	0.010	0.001	0.010	0.004	0.010	0.000
7440-66-6	30	Zn	0.087	0.005	0.086	0.004	0.086	0.015	0.086	0.000
7440-55-3	31	Ga	0.000	0.003	0.000	0.002	0.000	0.002	0.000	0.000
7440-38-2	33	As	0.012	0.007	0.000	0.006	0.001	0.006	0.001	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7726-95-6	35	Br	0.003	0.001	0.007	0.001	0.006	0.003	0.006	0.000
7440-17-7	37	Rb	0.005	0.001	0.014	0.001	0.014	0.005	0.014	0.000
7440-24-6	38	Sr	0.028	0.002	0.044	0.002	0.043	0.009	0.043	0.000
7440-65-5	39	Y	0.000	0.002	0.000	0.001	0.000	0.001	0.000	0.000
7440-67-7	40	Zr	0.000	0.009	0.000	0.004	0.000	0.006	0.000	0.000
7439-98-7	42	Mo	0.000	0.005	0.000	0.002	0.000	0.003	0.000	0.000
7440-05-3	46	Pd	0.000	0.005	0.000	0.002	0.000	0.003	0.000	0.000
7440-22-4	47	Ag	0.000	0.007	0.000	0.002	0.000	0.004	0.000	0.000
7440-43-9	48	Cd	0.000	0.009	0.000	0.003	0.000	0.006	0.000	0.000
7440-74-6	49	In	0.000	0.011	0.000	0.003	0.000	0.007	0.000	0.000
7440-31-5	50	Sn	0.000	0.014	0.000	0.004	0.000	0.008	0.000	0.000
7440-36-0	51	Sb	0.000	0.031	0.000	0.009	0.000	0.019	0.000	0.000
7440-39-3	56	Ba	0.000	0.058	0.055	0.017	0.051	0.036	0.051	0.000
7439-91-0	57	La	0.000	0.105	0.000	0.029	0.000	0.063	0.000	0.000
7439-97-6	80	Hg	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.101	0.007	0.114	0.006	0.113	0.017	0.113	0.000

```
PM Profile Speciation Report  -  continued (profile 41123)
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                     Total
                              0-2.5 um       2.5-10 um      0-10 um      Measured(1)
               Species      ------------   ------------   ------------   -----------
 CAS Number  Num   Sym       %wt    unc     %wt    unc     %wt    unc     %wt    unc
------------------------------------------------------------------------------
             201   OC       7.478  1.527  11.801  0.948  11.475  1.446  11.475  0.000
             202   EC       0.419  0.174   0.174  0.051   0.192  0.113   0.192  0.000
------------------------------------------------------------------------------
TOTALS:                    47.153         48.164         48.088         48.088
==============================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Paved Road Dust - Sepulveda Tunnel, Los Angeles,CA
Profile Number : 41124
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Surface dust sampled, aerosolized, and recollected with a Sierra dichotomous virtual impactor. Analyzed using XRF and flame ionization.

SCC Assignments: 113

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	7.087	0.357	7.353	0.368	7.336	0.792	7.336	0.000
7440-21-3	14	Si	17.853	0.894	20.843	1.045	20.653	2.090	20.653	0.000
7723-14-0	15	P	0.250	0.050	0.174	0.035	0.179	0.048	0.179	0.000
7704-34-9	16	S	2.066	0.116	1.145	0.072	1.204	0.202	1.204	0.000
7782-50-5	17	Cl	0.317	0.022	0.312	0.018	0.312	0.042	0.312	0.000
7440-09-7	19	K	0.917	0.048	1.532	0.077	1.493	0.139	1.493	0.000
7440-70-2	20	Ca	3.338	0.168	3.058	0.154	3.076	0.359	3.076	0.000
7440-32-6	22	Ti	0.517	0.027	0.620	0.033	0.614	0.069	0.614	0.000
7440-62-2	23	V	0.026	0.006	0.021	0.007	0.021	0.009	0.021	0.000
7440-47-3	24	Cr	0.027	0.002	0.039	0.002	0.039	0.008	0.039	0.000
7439-96-5	25	Mn	0.072	0.004	0.104	0.005	0.102	0.015	0.102	0.000
7439-89-6	26	Fe	3.673	0.186	5.530	0.278	5.413	0.499	5.413	0.000
7440-02-0	28	Ni	0.013	0.001	0.009	0.001	0.009	0.004	0.009	0.000
7440-50-8	29	Cu	0.077	0.004	0.095	0.005	0.094	0.015	0.094	0.000
7440-66-6	30	Zn	0.263	0.014	0.269	0.014	0.268	0.035	0.268	0.000
7440-55-3	31	Ga	0.001	0.002	0.003	0.002	0.002	0.002	0.002	0.000
7440-38-2	33	As	0.003	0.021	0.000	0.024	0.000	0.021	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.001	0.000	0.001	0.002	0.001	0.000
7726-95-6	35	Br	0.020	0.002	0.025	0.001	0.025	0.007	0.025	0.000
7440-17-7	37	Rb	0.000	0.001	0.013	0.001	0.012	0.004	0.012	0.000
7440-24-6	38	Sr	0.231	0.012	0.443	0.022	0.429	0.044	0.429	0.000
7440-65-5	39	Y	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.000
7440-67-7	40	Zr	0.083	0.016	0.012	0.024	0.016	0.022	0.016	0.000
7439-98-7	42	Mo	0.000	0.005	0.000	0.002	0.000	0.003	0.000	0.000
7440-05-3	46	Pd	0.011	0.006	0.000	0.002	0.001	0.004	0.001	0.000
7440-22-4	47	Ag	0.009	0.007	0.000	0.002	0.001	0.005	0.001	0.000
7440-43-9	48	Cd	0.012	0.009	0.006	0.003	0.007	0.007	0.007	0.000
7440-74-6	49	In	0.004	0.012	0.000	0.004	0.000	0.007	0.000	0.000
7440-31-5	50	Sn	0.003	0.014	0.000	0.005	0.000	0.009	0.000	0.000
7440-36-0	51	Sb	0.000	0.031	0.018	0.010	0.016	0.020	0.016	0.000
7440-39-3	56	Ba	0.091	0.059	0.162	0.021	0.158	0.042	0.158	0.000
7439-91-0	57	La	0.000	0.105	0.042	0.033	0.039	0.065	0.039	0.000
7439-97-6	80	Hg	0.001	0.001	0.002	0.000	0.002	0.002	0.002	0.000
7439-92-1	82	Pb	0.368	0.019	0.429	0.022	0.425	0.050	0.425	0.000

```
PM Profile Speciation Report  -  continued (profile 41124)
------------------------------------------------------------------------------------
Total Particulate Matter -
                                                                          Total
                               0-2.5 um       2.5-10 um       0-10 um      Measured(1)
                Species      ------------   ------------   ------------   -----------
 CAS Number   Num   Sym       %wt    unc     %wt    unc     %wt    unc     %wt    unc
------------------------------------------------------------------------------------
              201   OC      13.780  2.758  12.805  0.916  12.867  2.169  12.867  0.000
              202   EC       1.753  0.581   0.579  0.050   0.653  0.363   0.653  0.000
------------------------------------------------------------------------------------
TOTALS:                     52.866         55.644         55.467         55.467
====================================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Paved Road Dust - Freeway Composite
Profile Number : 41131
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Developed from profiles 41111 and 41112.

SCC Assignments: 113

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	6.471	0.710	6.690	0.710	6.667	0.935	6.667	0.000
7440-21-3	14	Si	20.849	2.854	19.901	2.415	19.999	3.171	19.999	0.000
7723-14-0	15	P	0.049	0.010	0.046	0.011	0.046	0.014	0.046	0.000
7704-34-9	16	S	0.615	0.259	0.359	0.359	0.385	0.313	0.385	0.000
7782-50-5	17	Cl	0.107	0.083	0.100	0.100	0.101	0.090	0.101	0.000
7440-09-7	19	K	0.943	0.300	1.354	0.337	1.316	0.327	1.316	0.000
7440-70-2	20	Ca	3.615	0.466	4.748	0.236	4.627	0.515	4.627	0.000
7440-32-6	22	Ti	0.468	0.076	0.543	0.050	0.535	0.080	0.535	0.000
7440-62-2	23	V	0.027	0.004	0.004	0.005	0.006	0.005	0.006	0.000
7440-47-3	24	Cr	0.020	0.001	0.021	0.001	0.021	0.006	0.021	0.000
7439-96-5	25	Mn	0.076	0.018	0.115	0.007	0.111	0.019	0.111	0.000
7439-89-6	26	Fe	4.117	0.413	5.765	0.232	5.597	0.557	5.597	0.000
7440-02-0	28	Ni	0.018	0.001	0.019	0.001	0.019	0.006	0.019	0.000
7440-50-8	29	Cu	0.038	0.006	0.035	0.001	0.035	0.009	0.035	0.000
7440-66-6	30	Zn	0.412	0.159	0.388	0.193	0.389	0.177	0.389	0.000
7440-55-3	31	Ga	0.000	0.002	0.001	0.003	0.001	0.003	0.001	0.000
7440-38-2	33	As	0.004	0.038	0.000	0.043	0.000	0.039	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7726-95-6	35	Br	0.006	0.002	0.006	0.005	0.006	0.005	0.006	0.000
7440-17-7	37	Rb	0.005	0.001	0.011	0.002	0.010	0.004	0.010	0.000
7440-24-6	38	Sr	0.083	0.011	0.130	0.018	0.126	0.022	0.126	0.000
7440-65-5	39	Y	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.000
7440-67-7	40	Zr	0.007	0.006	0.000	0.006	0.001	0.005	0.001	0.000
7439-98-7	42	Mo	0.000	0.003	0.000	0.001	0.000	0.002	0.000	0.000
7440-05-3	46	Pd	0.000	0.003	0.000	0.001	0.000	0.002	0.000	0.000
7440-22-4	47	Ag	0.000	0.004	0.001	0.002	0.000	0.003	0.000	0.000
7440-43-9	48	Cd	0.000	0.005	0.008	0.005	0.007	0.006	0.007	0.000
7440-74-6	49	In	0.000	0.006	0.000	0.003	0.000	0.004	0.000	0.000
7440-31-5	50	Sn	0.000	0.007	0.000	0.003	0.000	0.005	0.000	0.000
7440-36-0	51	Sb	0.000	0.016	0.000	0.007	0.000	0.010	0.000	0.000
7440-39-3	56	Ba	0.026	0.030	0.131	0.014	0.121	0.026	0.121	0.000
7439-91-0	57	La	0.000	0.054	0.000	0.022	0.000	0.035	0.000	0.000
7439-97-6	80	Hg	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.816	0.528	0.902	0.624	0.892	0.565	0.892	0.000
	201	OC	17.574	1.666	14.502	1.289	14.854	2.129	14.854	0.000
	202	EC	0.451	0.131	0.401	0.074	0.407	0.105	0.407	0.000
TOTALS:			56.800		56.184		56.282		56.282	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Paved Road Dust - Composite-Long Beach,CA
Profile Number : 41132
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Developed from profiles 41113 and 41114.

SCC Assignments: 113

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	5.398	0.611	5.431	0.577	5.429	0.775	5.429	0.000
7440-21-3	14	Si	15.316	1.857	15.197	1.615	15.208	2.209	15.208	0.000
7723-14-0	15	P	0.252	0.037	0.219	0.031	0.221	0.043	0.221	0.000
7704-34-9	16	S	0.789	0.213	0.717	0.186	0.722	0.202	0.722	0.000
7782-50-5	17	Cl	0.337	0.069	0.359	0.101	0.357	0.095	0.357	0.000
7440-09-7	19	K	1.241	0.066	1.592	0.057	1.568	0.154	1.568	0.000
7440-70-2	20	Ca	4.014	0.213	3.838	0.136	3.849	0.427	3.849	0.000
7440-32-6	22	Ti	0.337	0.018	0.410	0.016	0.405	0.046	0.405	0.000
7440-62-2	23	V	0.027	0.003	0.018	0.004	0.019	0.007	0.019	0.000
7440-47-3	24	Cr	0.023	0.002	0.029	0.001	0.028	0.007	0.028	0.000
7439-96-5	25	Mn	0.087	0.005	0.098	0.006	0.097	0.016	0.097	0.000
7439-89-6	26	Fe	3.830	0.204	4.546	0.232	4.497	0.460	4.497	0.000
7440-02-0	28	Ni	0.013	0.001	0.014	0.001	0.014	0.005	0.014	0.000
7440-50-8	29	Cu	0.025	0.002	0.025	0.001	0.025	0.007	0.025	0.000
7440-66-6	30	Zn	0.264	0.041	0.249	0.024	0.250	0.043	0.250	0.000
7440-55-3	31	Ga	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.000
7440-38-2	33	As	0.006	0.010	0.000	0.009	0.000	0.009	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.000
7726-95-6	35	Br	0.006	0.001	0.009	0.000	0.009	0.004	0.009	0.000
7440-17-7	37	Rb	0.002	0.001	0.011	0.001	0.010	0.004	0.010	0.000
7440-24-6	38	Sr	0.033	0.005	0.068	0.015	0.066	0.016	0.066	0.000
7440-65-5	39	Y	0.000	0.002	0.000	0.001	0.000	0.001	0.000	0.000
7440-67-7	40	Zr	0.000	0.009	0.014	0.003	0.014	0.007	0.014	0.000
7439-98-7	42	Mo	0.000	0.006	0.000	0.001	0.000	0.003	0.000	0.000
7440-05-3	46	Pd	0.000	0.006	0.000	0.001	0.000	0.003	0.000	0.000
7440-22-4	47	Ag	0.000	0.007	0.000	0.002	0.000	0.004	0.000	0.000
7440-43-9	48	Cd	0.000	0.010	0.004	0.004	0.004	0.007	0.004	0.000
7440-74-6	49	In	0.000	0.012	0.000	0.003	0.000	0.007	0.000	0.000
7440-31-5	50	Sn	0.000	0.014	0.007	0.003	0.007	0.009	0.007	0.000
7440-36-0	51	Sb	0.000	0.031	0.000	0.007	0.000	0.019	0.000	0.000
7440-39-3	56	Ba	0.000	0.059	0.088	0.016	0.082	0.038	0.082	0.000
7439-91-0	57	La	0.000	0.108	0.000	0.023	0.000	0.063	0.000	0.000
7439-97-6	80	Hg	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.229	0.073	0.218	0.066	0.219	0.071	0.219	0.000
	201	OC	19.626	3.370	18.959	1.467	19.002	2.926	19.002	0.000
	202	EC	2.213	0.425	1.188	0.100	1.254	0.319	1.254	0.000
TOTALS:			54.069		53.308		53.356		53.356	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Paved Road Dust - Hawthorne Composite
Profile Number : 41133
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Developed from profiles 41115 and 41116.

SCC Assignments: 113

Mass Fraction Data -				
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	5.992	0.676	6.953	1.143	6.894	1.134	6.894	0.000
7440-21-3	14	Si	16.131	1.826	18.201	2.568	18.072	2.756	18.072	0.000
7723-14-0	15	P	0.031	0.008	0.030	0.004	0.030	0.009	0.030	0.000
7704-34-9	16	S	0.434	0.214	0.291	0.107	0.299	0.152	0.299	0.000
7782-50-5	17	Cl	0.099	0.031	0.096	0.038	0.097	0.037	0.097	0.000
7440-09-7	19	K	0.998	0.083	1.556	0.142	1.522	0.173	1.522	0.000
7440-70-2	20	Ca	2.243	0.621	2.477	0.141	2.462	0.438	2.462	0.000
7440-32-6	22	Ti	0.317	0.017	0.463	0.055	0.454	0.062	0.454	0.000
7440-62-2	23	V	0.020	0.003	0.010	0.004	0.010	0.005	0.010	0.000
7440-47-3	24	Cr	0.014	0.004	0.018	0.001	0.017	0.006	0.017	0.000
7439-96-5	25	Mn	0.070	0.007	0.106	0.005	0.104	0.016	0.104	0.000
7439-89-6	26	Fe	3.399	0.178	4.773	0.529	4.690	0.569	4.690	0.000
7440-02-0	28	Ni	0.012	0.005	0.012	0.001	0.012	0.005	0.012	0.000
7440-50-8	29	Cu	0.021	0.010	0.017	0.004	0.017	0.008	0.017	0.000
7440-66-6	30	Zn	0.105	0.059	0.112	0.050	0.111	0.053	0.111	0.000
7440-55-3	31	Ga	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7440-38-2	33	As	0.003	0.005	0.000	0.004	0.000	0.004	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7726-95-6	35	Br	0.005	0.003	0.006	0.002	0.006	0.004	0.006	0.000
7440-17-7	37	Rb	0.004	0.001	0.013	0.001	0.012	0.004	0.012	0.000
7440-24-6	38	Sr	0.029	0.015	0.058	0.018	0.056	0.019	0.056	0.000
7440-65-5	39	Y	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000
7440-67-7	40	Zr	0.000	0.006	0.006	0.003	0.006	0.005	0.006	0.000
7439-98-7	42	Mo	0.000	0.004	0.000	0.001	0.000	0.002	0.000	0.000
7440-05-3	46	Pd	0.000	0.004	0.000	0.001	0.000	0.002	0.000	0.000
7440-22-4	47	Ag	0.000	0.005	0.000	0.002	0.000	0.003	0.000	0.000
7440-43-9	48	Cd	0.000	0.006	0.000	0.002	0.000	0.004	0.000	0.000
7440-74-6	49	In	0.000	0.007	0.000	0.003	0.000	0.005	0.000	0.000
7440-31-5	50	Sn	0.000	0.009	0.002	0.003	0.002	0.006	0.002	0.000
7440-36-0	51	Sb	0.000	0.019	0.003	0.007	0.002	0.012	0.002	0.000
7440-39-3	56	Ba	0.000	0.037	0.092	0.013	0.086	0.026	0.086	0.000
7439-91-0	57	La	0.000	0.067	0.002	0.022	0.002	0.041	0.002	0.000
7439-97-6	80	Hg	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.103	0.077	0.091	0.042	0.092	0.056	0.092	0.000
TOTALS:			30.030		35.389		35.056		35.056	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Paved Road Dust - Burbank Composite
Profile Number : 41134
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Developed from profiles 41117 and 41118.

SCC Assignments: 113

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	4.286	0.492	4.974	0.528	4.941	0.665	4.941	0.000
7440-21-3	14	Si	12.550	1.439	13.845	1.469	13.779	1.884	13.779	0.000
7723-14-0	15	P	0.274	0.051	0.248	0.035	0.249	0.051	0.249	0.000
7704-34-9	16	S	0.868	0.049	0.702	0.025	0.710	0.093	0.710	0.000
7782-50-5	17	Cl	0.358	0.020	0.372	0.017	0.371	0.046	0.371	0.000
7440-09-7	19	K	0.877	0.049	1.342	0.048	1.319	0.121	1.319	0.000
7440-70-2	20	Ca	4.742	0.801	5.359	0.373	5.333	0.729	5.333	0.000
7440-32-6	22	Ti	0.332	0.019	0.436	0.017	0.431	0.047	0.431	0.000
7440-62-2	23	V	0.022	0.003	0.020	0.004	0.020	0.007	0.020	0.000
7440-47-3	24	Cr	0.021	0.002	0.029	0.002	0.028	0.007	0.028	0.000
7439-96-5	25	Mn	0.071	0.005	0.093	0.003	0.092	0.014	0.092	0.000
7439-89-6	26	Fe	3.428	0.193	4.449	0.169	4.399	0.418	4.399	0.000
7440-02-0	28	Ni	0.010	0.001	0.013	0.001	0.013	0.004	0.013	0.000
7440-50-8	29	Cu	0.033	0.008	0.033	0.007	0.033	0.010	0.033	0.000
7440-66-6	30	Zn	0.242	0.025	0.245	0.030	0.245	0.040	0.245	0.000
7440-55-3	31	Ga	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.000
7440-38-2	33	As	0.007	0.010	0.000	0.011	0.000	0.010	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7726-95-6	35	Br	0.006	0.002	0.010	0.002	0.010	0.004	0.010	0.000
7440-17-7	37	Rb	0.000	0.001	0.010	0.001	0.010	0.004	0.010	0.000
7440-24-6	38	Sr	0.023	0.004	0.052	0.002	0.051	0.010	0.051	0.000
7440-65-5	39	Y	0.000	0.002	0.000	0.001	0.000	0.001	0.000	0.000
7440-67-7	40	Zr	0.000	0.008	0.005	0.005	0.004	0.006	0.004	0.000
7439-98-7	42	Mo	0.000	0.005	0.002	0.002	0.002	0.003	0.002	0.000
7440-05-3	46	Pd	0.000	0.005	0.000	0.001	0.000	0.003	0.000	0.000
7440-22-4	47	Ag	0.000	0.007	0.000	0.001	0.000	0.004	0.000	0.000
7440-43-9	48	Cd	0.000	0.009	0.005	0.005	0.005	0.007	0.005	0.000
7440-74-6	49	In	0.000	0.011	0.000	0.002	0.000	0.006	0.000	0.000
7440-31-5	50	Sn	0.000	0.013	0.006	0.006	0.006	0.009	0.006	0.000
7440-36-0	51	Sb	0.000	0.028	0.000	0.006	0.000	0.017	0.000	0.000
7440-39-3	56	Ba	0.000	0.053	0.074	0.012	0.070	0.033	0.070	0.000
7439-91-0	57	La	0.000	0.096	0.000	0.020	0.000	0.057	0.000	0.000
7439-97-6	80	Hg	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.231	0.050	0.280	0.054	0.277	0.059	0.277	0.000
	201	OC	10.647	1.789	15.978	2.163	15.651	2.296	15.651	0.000
	202	EC	0.999	0.216	1.778	0.225	1.730	0.251	1.730	0.000
TOTALS:			40.028		50.360		49.779		49.779	

(1) Estimated / extrapolated.

```
PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Paved Road Dust - Los Angeles Composite
Profile Number : 41135
Data Quality   : C
------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1
Data Source    : Developed from profiles 41119 and 41120.

SCC Assignments: 113

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.250         0.370           0.440
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                                0-2.5 um      2.5-10 um      0-10 um    Measured(1)
                 Species      -----------   -----------   -----------   -----------
 CAS Number   Num   Sym        %wt    unc    %wt    unc    %wt    unc    %wt    unc
------------------------------------------------------------------------------
  7429-90-5   13    Al       3.675  0.782  4.297  0.563  4.266  0.728  4.266  0.000
  7440-21-3   14    Si       9.919  1.170 11.438  1.215 11.366  1.534 11.366  0.000
  7723-14-0   15    P        0.373  0.150  0.360  0.136  0.361  0.140  0.361  0.000
  7704-34-9   16    S        0.898  0.056  0.810  0.029  0.814  0.100  0.814  0.000
  7782-50-5   17    Cl       0.311  0.041  0.364  0.064  0.361  0.067  0.361  0.000
  7440-09-7   19    K        0.652  0.040  1.083  0.038  1.062  0.097  1.062  0.000
  7440-70-2   20    Ca       3.243  0.366  4.060  0.345  4.022  0.488  4.022  0.000
  7440-32-6   22    Ti       0.305  0.047  0.457  0.103  0.450  0.093  0.450  0.000
  7440-62-2   23    V        0.028  0.003  0.026  0.007  0.026  0.009  0.026  0.000
  7440-47-3   24    Cr       0.048  0.018  0.071  0.032  0.070  0.028  0.070  0.000
  7439-96-5   25    Mn       0.078  0.005  0.084  0.004  0.084  0.014  0.084  0.000
  7439-89-6   26    Fe       5.210  1.910  5.376  0.755  5.375  1.333  5.375  0.000
  7440-02-0   28    Ni       0.029  0.019  0.041  0.029  0.041  0.026  0.041  0.000
  7440-50-8   29    Cu       0.053  0.004  0.060  0.002  0.060  0.011  0.060  0.000
  7440-66-6   30    Zn       0.428  0.030  0.431  0.015  0.431  0.053  0.431  0.000
  7440-55-3   31    Ga       0.000  0.001  0.000  0.001  0.000  0.001  0.000  0.000
  7440-38-2   33    As       0.010  0.009  0.000  0.010  0.000  0.009  0.000  0.000
  7782-49-2   34    Se       0.000  0.001  0.000  0.000  0.000  0.000  0.000  0.000
  7726-95-6   35    Br       0.002  0.001  0.006  0.000  0.006  0.003  0.006  0.000
  7440-17-7   37    Rb       0.000  0.001  0.009  0.000  0.008  0.004  0.008  0.000
  7440-24-6   38    Sr       0.021  0.009  0.075  0.009  0.072  0.014  0.072  0.000
  7440-65-5   39    Y        0.000  0.002  0.000  0.001  0.000  0.001  0.000  0.000
  7440-67-7   40    Zr       0.000  0.009  0.009  0.004  0.008  0.007  0.008  0.000
  7439-98-7   42    Mo       0.000  0.005  0.010  0.006  0.009  0.007  0.009  0.000
  7440-05-3   46    Pd       0.000  0.005  0.000  0.001  0.000  0.003  0.000  0.000
  7440-22-4   47    Ag       0.000  0.007  0.000  0.002  0.000  0.004  0.000  0.000
  7440-43-9   48    Cd       0.000  0.009  0.000  0.002  0.000  0.005  0.000  0.000
  7440-74-6   49    In       0.000  0.011  0.000  0.003  0.000  0.007  0.000  0.000
  7440-31-5   50    Sn       0.000  0.014  0.010  0.003  0.009  0.009  0.009  0.000
  7440-36-0   51    Sb       0.000  0.030  0.000  0.007  0.000  0.018  0.000  0.000
  7440-39-3   56    Ba       0.000  0.056  0.070  0.021  0.067  0.037  0.067  0.000
  7439-91-0   57    La       0.000  0.102  0.000  0.022  0.000  0.060  0.000  0.000
  7439-97-6   80    Hg       0.000  0.001  0.000  0.000  0.000  0.001  0.000  0.000
  7439-92-1   82    Pb       0.209  0.073  0.241  0.066  0.240  0.071  0.240  0.000
             201    OC      19.267  5.579 21.522  1.631 21.403  3.935 21.403  0.000
             202    EC       0.858  0.432  1.718  0.137  1.672  0.296  1.672  0.000
------------------------------------------------------------------------------
TOTALS:                     45.617        52.628        52.283        52.283
==============================================================================
(1)  Estimated / extrapolated.
```

```
PM Profile Speciation Report
-------------------------------------------------------------------------------
Profile Name   : Paved Road Dust - Anaheim Composite
Profile Number : 41136
Data Quality   : C
-------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1
Data Source    : Developed from profiles 41121 amd 41122.

SCC Assignments: 113

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.250         0.370           0.440
-------------------------------------------------------------------------------
Total Particulate Matter -
                                                                          Total
                                   0-2.5 um      2.5-10 um      0-10 um      Measured(1)
                  Species        ------------  ------------  ------------  ------------
 CAS Number  Num  Sym             %wt    unc    %wt    unc    %wt    unc    %wt    unc
-------------------------------------------------------------------------------
  7429-90-5  13   Al             4.407  0.586  4.490  0.769  4.484  0.803  4.484  0.000
  7440-21-3  14   Si            12.337  1.692 12.899  1.521 12.867  1.944 12.867  0.000
  7723-14-0  15   P              0.241  0.049  0.211  0.030  0.213  0.046  0.213  0.000
  7704-34-9  16   S              1.075  0.134  1.068  0.169  1.069  0.186  1.069  0.000
  7782-50-5  17   Cl             0.615  0.203  0.606  0.192  0.606  0.197  0.606  0.000
  7440-09-7  19   K              0.960  0.113  1.390  0.071  1.366  0.145  1.366  0.000
  7440-70-2  20   Ca             3.999  0.891  4.595  0.731  4.561  0.859  4.561  0.000
  7440-32-6  22   Ti             0.263  0.075  0.356  0.068  0.351  0.076  0.351  0.000
  7440-62-2  23   V              0.021  0.003  0.018  0.003  0.018  0.006  0.018  0.000
  7440-47-3  24   Cr             0.023  0.002  0.031  0.005  0.031  0.008  0.031  0.000
  7439-96-5  25   Mn             0.074  0.024  0.090  0.017  0.089  0.023  0.089  0.000
  7439-89-6  26   Fe             2.909  0.641  3.861  0.445  3.807  0.594  3.807  0.000
  7440-02-0  28   Ni             0.011  0.003  0.013  0.002  0.013  0.005  0.013  0.000
  7440-50-8  29   Cu             0.032  0.009  0.019  0.002  0.020  0.008  0.020  0.000
  7440-66-6  30   Zn             0.211  0.012  0.187  0.009  0.189  0.027  0.189  0.000
  7440-55-3  31   Ga             0.000  0.001  0.000  0.001  0.000  0.001  0.000  0.000
  7440-38-2  33   As             0.003  0.006  0.000  0.007  0.000  0.006  0.000  0.000
  7782-49-2  34   Se             0.000  0.001  0.000  0.000  0.000  0.000  0.000  0.000
  7726-95-6  35   Br             0.006  0.001  0.009  0.002  0.009  0.004  0.009  0.000
  7440-17-7  37   Rb             0.001  0.001  0.011  0.001  0.011  0.004  0.011  0.000
  7440-24-6  38   Sr             0.058  0.023  0.095  0.037  0.093  0.034  0.093  0.000
  7440-65-5  39   Y              0.000  0.002  0.000  0.001  0.000  0.001  0.000  0.000
  7440-67-7  40   Zr             0.000  0.008  0.012  0.004  0.012  0.007  0.012  0.000
  7439-98-7  42   Mo             0.000  0.005  0.001  0.001  0.001  0.003  0.001  0.000
  7440-05-3  46   Pd             0.000  0.005  0.002  0.002  0.002  0.003  0.002  0.000
  7440-22-4  47   Ag             0.000  0.006  0.002  0.002  0.002  0.004  0.002  0.000
  7440-43-9  48   Cd             0.000  0.008  0.005  0.002  0.004  0.006  0.004  0.000
  7440-74-6  49   In             0.000  0.010  0.000  0.002  0.000  0.006  0.000  0.000
  7440-31-5  50   Sn             0.000  0.013  0.007  0.003  0.007  0.008  0.007  0.000
  7440-36-0  51   Sb             0.000  0.028  0.000  0.006  0.000  0.016  0.000  0.000
  7440-39-3  56   Ba             0.000  0.052  0.062  0.046  0.059  0.046  0.059  0.000
  7439-91-0  57   La             0.000  0.094  0.000  0.020  0.000  0.055  0.000  0.000
  7439-97-6  80   Hg             0.000  0.001  0.001  0.001  0.001  0.001  0.001  0.000
  7439-92-1  82   Pb             0.147  0.020  0.172  0.006  0.170  0.025  0.170  0.000
-------------------------------------------------------------------------------
TOTALS:                         27.393        30.213        30.055        30.055
===============================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Paved Road Dust - SCAB Composite
Profile Number : 41137
Data Quality : C

Control Device : Not Applicable
Reference(s) : SOCAB
Data Source : Developed from profiles 41131, 41132, 41133, 41134, 41135, 41123, and 41124.

SCC Assignments: 113

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.250	0.370	0.440

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	5.704	0.556	5.914	0.443	5.904	0.737	5.904	0.000
7440-21-3	14	Si	15.444	1.296	16.099	1.191	16.072	1.936	16.072	0.000
7723-14-0	15	P	0.212	0.041	0.184	0.038	0.186	0.045	0.186	0.000
7704-34-9	16	S	0.935	0.175	0.706	0.108	0.721	0.157	0.721	0.000
7782-50-5	17	Cl	0.298	0.058	0.305	0.059	0.305	0.066	0.305	0.000
7440-09-7	19	K	1.032	0.107	1.470	0.085	1.443	0.154	1.443	0.000
7440-70-2	20	Ca	3.623	0.257	3.966	0.332	3.942	0.474	3.942	0.000
7440-32-6	22	Ti	0.375	0.033	0.473	0.029	0.467	0.056	0.467	0.000
7440-62-2	23	V	0.025	0.001	0.017	0.003	0.018	0.006	0.018	0.000
7440-47-3	24	Cr	0.025	0.004	0.033	0.006	0.033	0.009	0.033	0.000
7439-96-5	25	Mn	0.081	0.006	0.101	0.004	0.100	0.015	0.100	0.000
7439-89-6	26	Fe	3.920	0.269	4.927	0.225	4.859	0.487	4.859	0.000
7440-02-0	28	Ni	0.014	0.002	0.016	0.004	0.016	0.006	0.016	0.000
7440-50-8	29	Cu	0.036	0.007	0.037	0.010	0.037	0.012	0.037	0.000
7440-66-6	30	Zn	0.251	0.044	0.246	0.043	0.246	0.051	0.246	0.000
7440-55-3	31	Ga	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.000
7440-38-2	33	As	0.006	0.006	0.000	0.007	0.000	0.006	0.000	0.000
7782-49-2	34	Se	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
7726-95-6	35	Br	0.007	0.002	0.010	0.002	0.010	0.004	0.010	0.000
7440-17-7	37	Rb	0.002	0.001	0.012	0.001	0.011	0.004	0.011	0.000
7440-24-6	38	Sr	0.063	0.025	0.121	0.047	0.117	0.041	0.117	0.000
7440-65-5	39	Y	0.000	0.001	0.001	0.000	0.000	0.001	0.000	0.000
7440-67-7	40	Zr	0.011	0.010	0.007	0.003	0.008	0.007	0.008	0.000
7439-98-7	42	Mo	0.000	0.002	0.002	0.001	0.002	0.002	0.002	0.000
7440-05-3	46	Pd	0.001	0.002	0.000	0.001	0.000	0.001	0.000	0.000
7440-22-4	47	Ag	0.001	0.002	0.000	0.001	0.000	0.001	0.000	0.000
7440-43-9	48	Cd	0.001	0.003	0.004	0.001	0.003	0.003	0.003	0.000
7440-74-6	49	In	0.001	0.004	0.000	0.001	0.000	0.002	0.000	0.000
7440-31-5	50	Sn	0.000	0.004	0.004	0.001	0.004	0.004	0.004	0.000
7440-36-0	51	Sb	0.000	0.010	0.003	0.003	0.002	0.006	0.002	0.000
7440-39-3	56	Ba	0.015	0.018	0.092	0.013	0.087	0.019	0.087	0.000
7439-91-0	57	La	0.000	0.033	0.006	0.009	0.005	0.020	0.005	0.000
7439-97-6	80	Hg	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.275	0.083	0.306	0.093	0.303	0.091	0.303	0.000
	201	OC	14.729	2.023	15.928	1.520	15.875	2.208	15.875	0.000

PM Profile Speciation Report - continued (profile 41137)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um %wt	0-10 um unc	Total Measured(1) %wt	Total Measured(1) unc
	202	EC	1.116	0.295	0.973	0.281	0.985	0.292	0.985	0.000
TOTALS:			48.203		51.963		51.761		51.761	

(1) Estimated / extrapolated.

3.11 NATURAL SOURCES

Natural sources of particulate emissions include sources such as marine aerosols, volcanic ash, crustal sources, and soil dust. Marine aerosol particulates would be most significant in coastal areas. Volcanic ash, crustal sources, and soil dust would be more significant in rural areas than urban areas.

PM Profile Speciation Report

Profile Name : Soil Dust - Laurel MD
Profile Number : 41321
Data Quality : C

Control Device : Not Applicable
Reference(s) : 3,24
Data Source : Sieved and resuspended; analyzed by PGAA and INAA.

SCC Assignments: 058

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.020	0.040	0.080

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-42-8	5	B	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000
7440-23-5	11	Na	0.316	0.029	0.275	0.026	0.285	0.020	0.190	0.010
7439-95-4	12	Mg	0.000	0.000	0.000	0.000	0.000	0.000	3.500	0.350
7429-90-5	13	Al	11.862	0.142	11.614	0.163	11.676	0.518	7.892	0.087
7440-21-3	14	Si	0.000	0.000	0.000	0.000	0.000	0.000	34.201	1.700
7782-50-5	17	Cl	0.608	0.045	0.541	0.018	0.558	0.030	0.019	0.001
7440-09-7	19	K	2.472	0.106	2.851	0.145	2.756	0.137	1.799	0.284
7440-22-2	21	Sc	0.002	0.000	0.002	0.000	0.002	0.000	0.001	0.000
7440-32-6	22	Ti	0.666	0.183	1.115	0.145	1.003	0.093	0.886	0.115
7440-62-2	23	V	0.022	0.002	0.023	0.002	0.023	0.002	0.009	0.001
7440-47-3	24	Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.002
7439-96-5	25	Mn	0.103	0.005	0.101	0.005	0.101	0.006	0.067	0.002
7439-89-6	26	Fe	5.991	0.359	5.624	0.281	5.716	0.304	3.798	0.190
7440-48-4	27	Co	0.003	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7440-66-6	30	Zn	0.009	0.001	0.013	0.003	0.012	0.002	0.011	0.001
7440-55-3	31	Ga	0.003	0.000	0.003	0.000	0.003	0.000	0.002	0.000
7440-38-2	33	As	0.003	0.000	0.002	0.000	0.002	0.000	0.001	0.000
7726-95-6	35	Br	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-17-7	37	Rb	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.001
7440-67-7	40	Zr	0.000	0.000	0.000	0.000	0.000	0.000	0.068	0.008
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-46-2	55	Cs	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000
7440-39-3	56	Ba	0.000	0.000	0.000	0.000	0.000	0.000	0.034	0.003
7439-91-0	57	La	0.007	0.000	0.006	0.000	0.006	0.001	0.005	0.000
7440-45-1	58	Ce	0.009	0.001	0.009	0.001	0.009	0.001	0.007	0.000
7440-00-8	60	Nd	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000
7440-19-9	62	Sm	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-54-2	64	Gd	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-58-6	72	Hf	0.001	0.000	0.001	0.000	0.001	0.000	0.002	0.000
7440-29-1	90	Th	0.002	0.000	0.002	0.000	0.002	0.000	0.001	0.000
TOTALS:			22.082		22.187		22.160		52.524	

(1) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

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PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Soil Dust - Washington,D.C. area
Profile Number : 41322
Data Quality   : E
------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 3,25
Data Source    : Fifty-gram surface sample and one-kg subsurface sample
                 collected at each of four sites.  Analyzed by INAA and IPAA.

SCC Assignments: 058

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.020         0.040           0.080
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                           0-2.5 um(1)   2.5-10 um(1)   0-10 um(1)     Measured
              Species      ------------  ------------  ------------  ------------
 CAS Number  Num   Sym     %wt    unc    %wt    unc    %wt    unc    %wt    unc
------------------------------------------------------------------------------
  7440-23-5   11   Na      0.320 0.000   0.320 0.000   0.320 0.000   0.320 0.026
  7439-95-4   12   Mg      0.560 0.000   0.560 0.000   0.560 0.000   0.560 0.120
  7429-90-5   13   Al      5.990 0.000   5.990 0.000   5.990 0.000   5.990 1.080
  7440-21-3   14   Si     35.001 0.000  35.001 0.000  35.001 0.000  35.001 7.000
  7440-70-2   20   Ca      0.490 0.000   0.490 0.000   0.490 0.000   0.490 0.150
  7440-22-2   21   Sc      0.001 0.000   0.001 0.000   0.001 0.000   0.001 0.000
  7440-62-2   23   V       0.014 0.000   0.014 0.000   0.014 0.000   0.014 0.003
  7440-47-3   24   Cr      0.006 0.000   0.006 0.000   0.006 0.000   0.006 0.001
  7439-96-5   25   Mn      0.099 0.000   0.099 0.000   0.099 0.000   0.099 0.009
  7439-89-6   26   Fe      3.780 0.000   3.780 0.000   3.780 0.000   3.780 0.600
  7440-48-4   27   Co      0.002 0.000   0.002 0.000   0.002 0.000   0.002 0.000
  7440-66-6   30   Zn      0.008 0.000   0.008 0.000   0.008 0.000   0.008 0.002
  7440-38-2   33   As      0.000 0.000   0.000 0.000   0.000 0.000   0.000 0.000
  7782-49-2   34   Se      0.000 0.000   0.000 0.000   0.000 0.000   0.000 0.000
  7726-95-6   35   Br      0.001 0.000   0.001 0.000   0.001 0.000   0.001 0.000
  7440-36-0   51   Sb      0.000 0.000   0.000 0.000   0.000 0.000   0.000 0.000
  7440-46-2   55   Cs      0.000 0.000   0.000 0.000   0.000 0.000   0.000 0.000
  7440-39-3   56   Ba      0.052 0.000   0.052 0.000   0.052 0.000   0.052 0.013
  7439-91-0   57   La      0.006 0.000   0.006 0.000   0.006 0.000   0.006 0.001
  7440-45-1   58   Ce      0.007 0.000   0.007 0.000   0.007 0.000   0.007 0.002
  7440-19-9   62   Sm      0.001 0.000   0.001 0.000   0.001 0.000   0.001 0.000
  7440-53-1   63   Eu      0.000 0.000   0.000 0.000   0.000 0.000   0.000 0.000
  7440-64-4   70   Yb      0.000 0.000   0.000 0.000   0.000 0.000   0.000 0.000
  7439-94-3   71   Lu      0.000 0.000   0.000 0.000   0.000 0.000   0.000 0.000
  7440-58-6   72   Hf      0.001 0.000   0.001 0.000   0.001 0.000   0.001 0.000
  7440-25-7   73   Ta      0.000 0.000   0.000 0.000   0.000 0.000   0.000 0.000
  7440-29-1   90   Th      0.001 0.000   0.001 0.000   0.001 0.000   0.001 0.000
------------------------------------------------------------------------------
TOTALS:                   46.340        46.340        46.340        46.340
==============================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Soil Dust - Riverside, CA
Profile Number : 41323
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Surface dust sampled, aerosolized, and recollected with a Sierra dichotomous virtual impactor. Analyzed using XRF and flame ionization.

SCC Assignments: 058

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.020	0.040	0.080

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	9.890	1.484	9.231	1.385	9.267	0.890	9.267	0.000
7440-21-3	14	Si	20.360	3.054	19.190	2.878	19.253	1.845	19.253	0.000
7723-14-0	15	P	0.212	0.043	0.175	0.035	0.177	0.022	0.177	0.000
7704-34-9	16	S	0.406	0.020	0.332	0.017	0.336	0.020	0.336	0.000
7782-50-5	17	Cl	0.157	0.008	0.179	0.009	0.177	0.009	0.177	0.000
7440-09-7	19	K	1.981	0.099	2.227	0.111	2.213	0.109	2.213	0.000
7440-70-2	20	Ca	2.831	0.142	2.900	0.145	2.897	0.148	2.897	0.000
7440-32-6	22	Ti	0.529	0.027	0.556	0.029	0.554	0.029	0.554	0.000
7440-62-2	23	V	0.038	0.006	0.025	0.006	0.026	0.004	0.026	0.000
7440-47-3	24	Cr	0.024	0.002	0.029	0.002	0.029	0.002	0.029	0.000
7439-96-5	25	Mn	0.159	0.008	0.150	0.008	0.150	0.008	0.150	0.000
7439-89-6	26	Fe	5.671	0.286	5.955	0.299	5.940	0.300	5.940	0.000
7440-02-0	28	Ni	0.009	0.001	0.007	0.001	0.007	0.001	0.007	0.000
7440-50-8	29	Cu	0.011	0.002	0.007	0.001	0.007	0.001	0.007	0.000
7440-66-6	30	Zn	0.028	0.002	0.026	0.001	0.027	0.002	0.027	0.000
7440-55-3	31	Ga	0.003	0.001	0.000	0.003	0.000	0.001	0.000	0.000
7440-38-2	33	As	0.008	0.003	0.000	0.002	0.000	0.001	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7726-95-6	35	Br	0.002	0.001	0.003	0.000	0.003	0.001	0.003	0.000
7440-17-7	37	Rb	0.007	0.002	0.016	0.001	0.016	0.001	0.016	0.000
7440-24-6	38	Sr	0.012	0.002	0.028	0.002	0.027	0.002	0.027	0.000
7440-65-5	39	Y	0.000	0.002	0.006	0.001	0.006	0.001	0.006	0.000
7440-67-7	40	Zr	0.000	0.011	0.000	0.003	0.000	0.003	0.000	0.000
7439-98-7	42	Mo	0.000	0.007	0.000	0.001	0.000	0.002	0.000	0.000
7440-05-3	46	Pd	0.000	0.007	0.000	0.001	0.000	0.002	0.000	0.000
7440-22-4	47	Ag	0.000	0.009	0.000	0.002	0.000	0.002	0.000	0.000
7440-43-9	48	Cd	0.000	0.012	0.000	0.002	0.000	0.003	0.000	0.000
7440-74-6	49	In	0.000	0.014	0.000	0.003	0.000	0.004	0.000	0.000
7440-31-5	50	Sn	0.000	0.017	0.000	0.003	0.000	0.005	0.000	0.000
7440-36-0	51	Sb	0.000	0.038	0.000	0.007	0.000	0.010	0.000	0.000
7440-39-3	56	Ba	0.000	0.071	0.050	0.013	0.048	0.019	0.048	0.000
7439-91-0	57	La	0.000	0.128	0.000	0.022	0.000	0.034	0.000	0.000
7439-97-6	80	Hg	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	0.013	0.004	0.030	0.002	0.029	0.002	0.029	0.000
TOTALS:			42.352		41.122		41.189		41.189	

(1) Estimated / extrapolated.

```
PM Profile Speciation Report
-----------------------------------------------------------------------------
Profile Name   : Soil Dust - Hawthorne, CA
Profile Number : 41324
Data Quality   : C
-----------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1
Data Source    : Surface dust sampled, aerosolized, and recollected with a
                 Sierra dichotomous virtual impactor. Analyzed using XRF and
                 flame ionization.

SCC Assignments: 058

Mass Fraction Data -  Size Interval (um) :    (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :     0.020         0.040          0.080
-----------------------------------------------------------------------------
Total Particulate Matter -
                                                                      Total
                                 0-2.5 um      2.5-10 um      0-10 um      Measured(1)
                  Species      ------------  ------------  ------------  ------------
 CAS Number   Num   Sym        %wt    unc    %wt    unc    %wt    unc    %wt    unc
-----------------------------------------------------------------------------
  7429-90-5   13    Al      11.277  1.299 10.021  1.064  9.890  0.781  9.890  0.000
  7440-21-3   14    Si      23.575  2.717 21.218  2.251 20.802  1.645 20.802  0.000
  7723-14-0   15    P        0.033  0.005  0.012  0.012  0.011  0.006  0.011  0.000
  7704-34-9   16    S        0.300  0.050  0.095  0.013  0.101  0.018  0.101  0.000
  7782-50-5   17    Cl       0.061  0.026  0.020  0.001  0.022  0.007  0.022  0.000
  7440-09-7   19    K        1.470  0.084  1.683  0.060  1.622  0.077  1.622  0.000
  7440-70-2   20    Ca       1.278  0.092  1.319  0.047  1.275  0.065  1.275  0.000
  7440-32-6   22    Ti       0.541  0.038  0.581  0.031  0.558  0.030  0.558  0.000
  7440-62-2   23    V        0.025  0.006  0.023  0.005  0.023  0.003  0.023  0.000
  7440-47-3   24    Cr       0.019  0.004  0.021  0.002  0.021  0.002  0.021  0.000
  7439-96-5   25    Mn       0.107  0.007  0.129  0.005  0.124  0.006  0.124  0.000
  7439-89-6   26    Fe       5.178  0.298  5.593  0.200  5.417  0.262  5.417  0.000
  7440-02-0   28    Ni       0.007  0.003  0.008  0.001  0.008  0.001  0.008  0.000
  7440-50-8   29    Cu       0.013  0.005  0.005  0.001  0.006  0.002  0.006  0.000
  7440-66-6   30    Zn       0.051  0.028  0.016  0.002  0.018  0.007  0.018  0.000
  7440-55-3   31    Ga       0.001  0.001  0.000  0.002  0.000  0.001  0.000  0.000
  7440-38-2   33    As       0.015  0.007  0.000  0.001  0.001  0.002  0.001  0.000
  7782-49-2   34    Se       0.000  0.001  0.000  0.000  0.000  0.000  0.000  0.000
  7726-95-6   35    Br       0.000  0.001  0.002  0.002  0.001  0.001  0.001  0.000
  7440-17-7   37    Rb       0.001  0.002  0.013  0.001  0.012  0.001  0.012  0.000
  7440-24-6   38    Sr       0.019  0.003  0.034  0.003  0.032  0.002  0.032  0.000
  7440-65-5   39    Y        0.000  0.003  0.001  0.001  0.001  0.001  0.001  0.000
  7440-67-7   40    Zr       0.000  0.012  0.000  0.003  0.000  0.003  0.000  0.000
  7439-98-7   42    Mo       0.000  0.007  0.000  0.002  0.000  0.002  0.000  0.000
  7440-05-3   46    Pd       0.000  0.008  0.000  0.002  0.000  0.002  0.000  0.000
  7440-22-4   47    Ag       0.000  0.009  0.000  0.002  0.000  0.003  0.000  0.000
  7440-43-9   48    Cd       0.000  0.012  0.000  0.003  0.000  0.003  0.000  0.000
  7440-74-6   49    In       0.000  0.016  0.000  0.004  0.000  0.004  0.000  0.000
  7440-31-5   50    Sn       0.000  0.018  0.000  0.005  0.000  0.005  0.000  0.000
  7440-36-0   51    Sb       0.020  0.039  0.008  0.010  0.007  0.011  0.007  0.000
  7440-39-3   56    Ba       0.000  0.075  0.023  0.023  0.026  0.022  0.026  0.000
  7439-91-0   57    La       0.000  0.136  0.013  0.034  0.014  0.038  0.014  0.000
  7439-97-6   80    Hg       0.000  0.001  0.000  0.000  0.000  0.000  0.000  0.000
  7439-92-1   82    Pb       0.006  0.006  0.024  0.002  0.023  0.002  0.023  0.000
-----------------------------------------------------------------------------
TOTALS:                     43.997        40.862        40.015        40.015
=============================================================================
(1)  Estimated / extrapolated.
```

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PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Soil Dust - SCAB Composite
Profile Number : 41351
Data Quality   : C
------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1
Data Source    : Composite of surface dust samples collected to develop
                 profile #41323 and #41324.

SCC Assignments: 058

Mass Fraction Data -  Size Interval (um) :     (0-2.5)         (0-6)          (0-10)
                      Mass Fraction      :      0.020          0.040           0.080
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                     Total
                               0-2.5 um      2.5-10 um      0-10 um     Measured(1)
               Species       ------------  ------------  ------------  ------------
 CAS Number  Num   Sym        %wt    unc    %wt    unc    %wt    unc    %wt    unc
------------------------------------------------------------------------------
  7429-90-5   13   Al       10.583  1.011   9.626  0.873   9.683  0.673   9.683  0.000
  7440-21-3   14   Si       21.968  2.095  20.204  1.827  20.310  1.403  20.310  0.000
  7723-14-0   15   P         0.123  0.090   0.094  0.082   0.095  0.047   0.095  0.000
  7704-34-9   16   S         0.353  0.053   0.213  0.118   0.221  0.062   0.221  0.000
  7782-50-5   17   Cl        0.109  0.048   0.099  0.079   0.100  0.042   0.100  0.000
  7440-09-7   19   K         1.726  0.255   1.955  0.272   1.942  0.170   1.942  0.000
  7440-70-2   20   Ca        2.054  0.776   2.109  0.791   2.105  0.450   2.105  0.000
  7440-32-6   22   Ti        0.535  0.026   0.568  0.021   0.566  0.027   0.566  0.000
  7440-62-2   23   V         0.031  0.006   0.024  0.004   0.025  0.003   0.025  0.000
  7440-47-3   24   Cr        0.021  0.002   0.025  0.004   0.025  0.002   0.025  0.000
  7439-96-5   25   Mn        0.133  0.026   0.139  0.010   0.139  0.011   0.139  0.000
  7439-89-6   26   Fe        5.424  0.247   5.774  0.181   5.755  0.264   5.755  0.000
  7440-02-0   28   Ni        0.008  0.002   0.008  0.001   0.008  0.001   0.008  0.000
  7440-50-8   29   Cu        0.012  0.003   0.006  0.001   0.006  0.001   0.006  0.000
  7440-66-6   30   Zn        0.040  0.014   0.021  0.005   0.022  0.005   0.022  0.000
  7440-55-3   31   Ga        0.002  0.001   0.000  0.002   0.000  0.001   0.000  0.000
  7440-38-2   33   As        0.012  0.004   0.000  0.001   0.001  0.001   0.001  0.000
  7782-49-2   34   Se        0.000  0.001   0.000  0.000   0.000  0.000   0.000  0.000
  7726-95-6   35   Br        0.001  0.001   0.003  0.001   0.003  0.001   0.003  0.000
  7440-17-7   37   Rb        0.004  0.003   0.015  0.002   0.014  0.001   0.014  0.000
  7440-24-6   38   Sr        0.015  0.003   0.031  0.003   0.030  0.002   0.030  0.000
  7440-65-5   39   Y         0.000  0.002   0.003  0.003   0.003  0.002   0.003  0.000
  7440-67-7   40   Zr        0.000  0.008   0.000  0.002   0.000  0.002   0.000  0.000
  7439-98-7   42   Mo        0.000  0.005   0.000  0.001   0.000  0.001   0.000  0.000
  7440-05-3   46   Pd        0.000  0.005   0.000  0.001   0.000  0.001   0.000  0.000
  7440-22-4   47   Ag        0.000  0.006   0.000  0.001   0.000  0.002   0.000  0.000
  7440-43-9   48   Cd        0.000  0.008   0.000  0.002   0.000  0.002   0.000  0.000
  7440-74-6   49   In        0.000  0.011   0.000  0.002   0.000  0.003   0.000  0.000
  7440-31-5   50   Sn        0.000  0.012   0.000  0.003   0.000  0.003   0.000  0.000
  7440-36-0   51   Sb        0.010  0.027   0.004  0.006   0.005  0.007   0.005  0.000
  7440-39-3   56   Ba        0.000  0.052   0.037  0.014   0.035  0.015   0.035  0.000
  7439-91-0   57   La        0.000  0.094   0.006  0.020   0.006  0.026   0.006  0.000
  7439-97-6   80   Hg        0.000  0.001   0.000  0.000   0.000  0.000   0.000  0.000
  7439-92-1   82   Pb        0.009  0.004   0.027  0.003   0.026  0.002   0.026  0.000
------------------------------------------------------------------------------
TOTALS:                     43.173         40.991         41.125         41.125
==============================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Limestone, Crustal
Profile Number : 43304
Data Quality : E

Control Device : Not Applicable
Reference(s) : 1,29
Data Source : Data taken from Reference 1. For details, consult Reference 29.

SCC Assignments: 115

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.020	0.040	0.080

Total Particulate Matter -

	Species		0-2.5 um(1)		2.5-10 um(1)		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.040	0.000	0.040	0.000	0.040	0.000	0.040	0.004
7439-95-4	12	Mg	4.700	0.000	4.700	0.000	4.700	0.000	4.700	0.470
7429-90-5	13	Al	0.420	0.000	0.420	0.000	0.420	0.000	0.420	0.042
7440-21-3	14	Si	2.400	0.000	2.400	0.000	2.400	0.000	2.400	0.240
7723-14-0	15	P	0.040	0.000	0.040	0.000	0.040	0.000	0.040	0.004
7704-34-9	16	S	0.120	0.000	0.120	0.000	0.120	0.000	0.120	0.012
7782-50-5	17	Cl	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.002
7440-09-7	19	K	0.270	0.000	0.270	0.000	0.270	0.000	0.270	0.027
7440-70-2	20	Ca	30.200	0.000	30.200	0.000	30.200	0.000	30.200	3.020
7440-32-6	22	Ti	0.040	0.000	0.040	0.000	0.040	0.000	0.040	0.004
7440-62-2	23	V	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7440-47-3	24	Cr	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7439-96-5	25	Mn	0.110	0.000	0.110	0.000	0.110	0.000	0.110	0.011
7439-89-6	26	Fe	0.380	0.000	0.380	0.000	0.380	0.000	0.380	0.038
7440-02-0	28	Ni	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7440-66-6	30	Zn	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7726-95-6	35	Br	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-24-6	38	Sr	0.061	0.000	0.061	0.000	0.061	0.000	0.061	0.006
7440-39-3	56	Ba	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7439-92-1	82	Pb	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
	202	EC	11.400	0.000	11.400	0.000	11.400	0.000	11.400	1.140
TOTALS:			50.206		50.206		50.206		50.206	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Shale, Crustal
Profile Number : 43305
Data Quality : E

Control Device : Not Applicable
Reference(s) : 1,29
Data Source : Data taken from Reference 1. For details, consult Reference 29.

SCC Assignments: 115

Mass Fraction Data -			
Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
Mass Fraction :	0.020	0.040	0.080

Total Particulate Matter -

	Species		0-2.5 um(1)		2.5-10 um(1)		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.960	0.000	0.960	0.000	0.960	0.000	0.960	0.096
7439-95-4	12	Mg	1.500	0.000	1.500	0.000	1.500	0.000	1.500	0.150
7429-90-5	13	Al	8.000	0.000	8.000	0.000	8.000	0.000	8.000	0.800
7440-21-3	14	Si	27.300	0.000	27.300	0.000	27.300	0.000	27.300	2.730
7723-14-0	15	P	0.070	0.000	0.070	0.000	0.070	0.000	0.070	0.007
7704-34-9	16	S	0.240	0.000	0.240	0.000	0.240	0.000	0.240	0.024
7782-50-5	17	Cl	0.018	0.000	0.018	0.000	0.018	0.000	0.018	0.002
7440-09-7	19	K	2.660	0.000	2.660	0.000	2.660	0.000	2.660	0.266
7440-70-2	20	Ca	2.210	0.000	2.210	0.000	2.210	0.000	2.210	0.221
7440-32-6	22	Ti	0.460	0.000	0.460	0.000	0.460	0.000	0.460	0.046
7440-62-2	23	V	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.001
7440-47-3	24	Cr	0.009	0.000	0.009	0.000	0.009	0.000	0.009	0.001
7439-96-5	25	Mn	0.085	0.000	0.085	0.000	0.085	0.000	0.085	0.009
7439-89-6	26	Fe	4.720	0.000	4.720	0.000	4.720	0.000	4.720	0.472
7440-02-0	28	Ni	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.001
7440-50-8	29	Cu	0.005	0.000	0.005	0.000	0.005	0.000	0.005	0.001
7440-66-6	30	Zn	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.001
7440-17-7	37	Rb	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.001
7440-24-6	38	Sr	0.030	0.000	0.030	0.000	0.030	0.000	0.030	0.003
7440-31-5	50	Sn	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-39-3	56	Ba	0.058	0.000	0.058	0.000	0.058	0.000	0.058	0.006
7439-92-1	82	Pb	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
	202	EC	1.500	0.000	1.500	0.000	1.500	0.000	1.500	0.150
TOTALS:			49.872		49.872		49.872		49.872	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Sandstone, Crustal
Profile Number : 43306
Data Quality : E

Control Device : Not Applicable
Reference(s) : 1,30
Data Source : Data taken from Reference 1. For details, consult Reference 30.

SCC Assignments: 115

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.020	0.040	0.080

Total Particulate Matter -

	Species		0-2.5 um(1)		2.5-10 um(1)		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.334	0.000	0.334	0.000	0.334	0.000	0.334	0.067
7439-95-4	12	Mg	0.700	0.000	0.700	0.000	0.700	0.000	0.700	0.140
7429-90-5	13	Al	2.523	0.000	2.523	0.000	2.523	0.000	2.523	0.505
7440-21-3	14	Si	36.580	0.000	36.580	0.000	36.580	0.000	36.580	7.316
7723-14-0	15	P	0.035	0.000	0.035	0.000	0.035	0.000	0.035	0.007
7704-34-9	16	S	0.028	0.000	0.028	0.000	0.028	0.000	0.028	0.006
7440-09-7	19	K	1.087	0.000	1.087	0.000	1.087	0.000	1.087	0.218
7440-70-2	20	Ca	3.933	0.000	3.933	0.000	3.933	0.000	3.933	0.787
7440-32-6	22	Ti	0.150	0.000	0.150	0.000	0.150	0.000	0.150	0.030
7439-89-6	26	Fe	0.981	0.000	0.981	0.000	0.981	0.000	0.981	0.196
7440-39-3	56	Ba	0.045	0.000	0.045	0.000	0.045	0.000	0.045	0.009
	202	EC	1.373	0.000	1.373	0.000	1.373	0.000	1.373	0.275
TOTALS:			47.769		47.769		47.769		47.769	

(1) Estimated / extrapolated.

```
PM Profile Speciation Report
-------------------------------------------------------------------------------
Profile Name   : Sediment, Crustal
Profile Number : 43307
Data Quality   : E
-------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1,30
Data Source    : Data taken from Reference 1. For details, consult Reference
                 30.

SCC Assignments: 115

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.020         0.040           0.080
-------------------------------------------------------------------------------
Total Particulate Matter -
                                                                         Total
                              0-2.5 um(1)   2.5-10 um(1)   0-10 um(1)   Measured
                Species       -----------   -----------   -----------  -----------
 CAS Number   Num   Sym        %wt    unc    %wt    unc    %wt    unc   %wt    unc
-------------------------------------------------------------------------------
  7440-23-5    11   Na       0.839  0.000  0.839  0.000  0.839  0.000  0.839  0.168
  7439-95-4    12   Mg       1.598  0.000  1.598  0.000  1.598  0.000  1.598  0.320
  7429-90-5    13   Al       7.083  0.000  7.083  0.000  7.083  0.000  7.083  1.417
  7440-21-3    14   Si      27.063  0.000 27.063  0.000 27.063  0.000 27.063  5.413
  7723-14-0    15   P        0.057  0.000  0.057  0.000  0.057  0.000  0.057  0.011
  7704-34-9    16   S        0.216  0.000  0.216  0.000  0.216  0.000  0.216  0.043
  7440-09-7    19   K        2.374  0.000  2.374  0.000  2.374  0.000  2.374  0.475
  7440-70-2    20   Ca       4.211  0.000  4.211  0.000  4.211  0.000  4.211  0.842
  7440-32-6    22   Ti       0.341  0.000  0.341  0.000  0.341  0.000  0.341  0.068
  7439-89-6    26   Fe       4.042  0.000  4.042  0.000  4.042  0.000  4.042  0.808
              202   EC       2.129  0.000  2.129  0.000  2.129  0.000  2.129  0.426
-------------------------------------------------------------------------------
TOTALS:                     49.953        49.953        49.953        49.953
===============================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Igneous Rock
Profile Number : 43308
Data Quality : E

Control Device : Not Applicable
Reference(s) : 1,30
Data Source : Data taken from Reference 1. For details, consult Reference 30.

SCC Assignments: 115

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.020	0.040	0.080

Total Particulate Matter -

	Species		0-2.5 um(1)		2.5-10 um(1)		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	2.849	0.000	2.849	0.000	2.849	0.000	2.849	0.570
7439-95-4	12	Mg	2.105	0.000	2.105	0.000	2.105	0.000	2.105	0.421
7429-90-5	13	Al	8.115	0.000	8.115	0.000	8.115	0.000	8.115	1.623
7440-21-3	14	Si	27.618	0.000	27.618	0.000	27.618	0.000	27.618	5.524
7723-14-0	15	P	0.131	0.000	0.131	0.000	0.131	0.000	0.131	0.026
7440-09-7	19	K	2.598	0.000	2.598	0.000	2.598	0.000	2.598	0.520
7440-70-2	20	Ca	3.632	0.000	3.632	0.000	3.632	0.000	3.632	0.726
7440-32-6	22	Ti	0.629	0.000	0.629	0.000	0.629	0.000	0.629	0.126
7439-89-6	26	Fe	5.106	0.000	5.106	0.000	5.106	0.000	5.106	1.021
7440-39-3	56	Ba	0.054	0.000	0.054	0.000	0.054	0.000	0.054	0.011
	202	EC	0.027	0.000	0.027	0.000	0.027	0.000	0.027	0.006
TOTALS:			52.864		52.864		52.864		52.864	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Earth's Crust
Profile Number : 43309
Data Quality : E

Control Device : Not Applicable
Reference(s) : 1,30
Data Source : Data taken from Reference 1. For details, consult Reference 30.

SCC Assignments: 115

Mass Fraction Data -				
Size Interval (um)	:	(0-2.5)	(0-6)	(0-10)
Mass Fraction	:	0.020	0.040	0.080

Total Particulate Matter -

	Species		0-2.5 um(1)		2.5-10 um(1)		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	2.360	0.000	2.360	0.000	2.360	0.000	2.360	0.708
7439-95-4	12	Mg	2.330	0.000	2.330	0.000	2.330	0.000	2.330	0.699
7429-90-5	13	Al	8.320	0.000	8.320	0.000	8.320	0.000	8.320	2.496
7440-21-3	14	Si	28.200	0.000	28.200	0.000	28.200	0.000	28.200	8.460
7723-14-0	15	P	0.105	0.000	0.105	0.000	0.105	0.000	0.105	0.032
7704-34-9	16	S	0.026	0.000	0.026	0.000	0.026	0.000	0.026	0.008
7782-50-5	17	Cl	0.013	0.000	0.013	0.000	0.013	0.000	0.013	0.004
7440-09-7	19	K	2.090	0.000	2.090	0.000	2.090	0.000	2.090	0.627
7440-70-2	20	Ca	4.150	0.000	4.150	0.000	4.150	0.000	4.150	1.245
7440-32-6	22	Ti	0.570	0.000	0.570	0.000	0.570	0.000	0.570	0.171
7440-62-2	23	V	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.004
7440-47-3	24	Cr	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.003
7439-96-5	25	Mn	0.095	0.000	0.095	0.000	0.095	0.000	0.095	0.029
7439-89-6	26	Fe	5.630	0.000	5.630	0.000	5.630	0.000	5.630	1.689
7440-48-4	27	Co	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.001
7440-02-0	28	Ni	0.008	0.000	0.008	0.000	0.008	0.000	0.008	0.002
7440-50-8	29	Cu	0.006	0.000	0.006	0.000	0.006	0.000	0.006	0.002
7440-66-6	30	Zn	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.002
7440-55-3	31	Ga	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.001
7440-38-2	33	As	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7782-49-2	34	Se	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7726-95-6	35	Br	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-17-7	37	Rb	0.009	0.000	0.009	0.000	0.009	0.000	0.009	0.003
7440-24-6	38	Sr	0.038	0.000	0.038	0.000	0.038	0.000	0.038	0.011
7440-65-5	39	Y	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.001
7440-67-7	40	Zr	0.017	0.000	0.017	0.000	0.017	0.000	0.017	0.005
74400-30-1	41	Nb	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.001
7439-98-7	42	Mo	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-22-4	47	Ag	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-74-6	49	In	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-31-5	50	Sn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	0.043	0.000	0.043	0.000	0.043	0.000	0.043	0.013
7439-91-0	57	La	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.001

PM Profile Speciation Report - continued (profile 43309)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um(1) %wt	0-2.5 um(1) unc	2.5-10 um(1) %wt	2.5-10 um(1) unc	0-10 um(1) %wt	0-10 um(1) unc	Total Measured %wt	Total Measured unc
7440-45-1	58	Ce	0.006	0.000	0.006	0.000	0.006	0.000	0.006	0.002
7440-00-8	60	Nd	0.003	0.000	0.003	0.000	0.003	0.000	0.003	0.001
7439-97-6	80	Hg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-69-9	83	Bi	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	202	EC	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.006
TOTALS:			54.084		54.084		54.084		54.084	

(1) Estimated / extrapolated.

3.12 WOOD COMBUSTION

Forest fires, wood slash burning, and residential wood burning are area sources of particulate emissions in the category of wood combustion. Residential wood burning is commonly used to supplement conventional heating systems. Residential woodstoves are usually radiating or circulatory designs constructed from cast iron, heavy gauge sheet metal, or stainless steel. Emissions from wood combustion are affected by furnace design and operating conditions, and fuel characteristics such as fuel composition, moisture content, and effective burning surface area.

PM Profile Speciation Report

Profile Name : Slash Burning (Conifer-flaming phase)
Profile Number : 42305
Data Quality : E

Control Device : Not Applicable
Reference(s) : 26
Data Source : Samples collected 20 meters above slash fire over three ten-minute periods. Analyzed by gas chromatography.

SCC Assignments: 062, 50300201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.900	0.960	0.990

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um(1)		0-10 um(1)		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	2.734	3.664	2.734	0.000	2.734	0.000	2.734	0.000
7429-90-5	13	Al	0.120	0.083	0.120	0.000	0.120	0.000	0.120	0.000
7440-21-3	14	Si	0.091	0.064	0.091	0.000	0.091	0.000	0.091	0.000
7704-34-9	16	S	0.341	0.147	0.341	0.000	0.341	0.000	0.341	0.000
7782-50-5	17	Cl	0.556	0.317	0.556	0.000	0.556	0.000	0.556	0.000
7440-09-7	19	K	1.419	0.809	1.419	0.000	1.419	0.000	1.419	0.000
7440-70-2	20	Ca	0.182	0.231	0.182	0.000	0.182	0.000	0.182	0.000
7440-32-6	22	Ti	0.218	0.220	0.218	0.000	0.218	0.000	0.218	0.000
7440-62-2	23	V	0.069	0.122	0.069	0.000	0.069	0.000	0.069	0.000
7440-47-3	24	Cr	0.113	0.194	0.113	0.000	0.113	0.000	0.113	0.000
7439-96-5	25	Mn	0.038	0.033	0.038	0.000	0.038	0.000	0.038	0.000
7439-89-6	26	Fe	0.057	0.102	0.057	0.000	0.057	0.000	0.057	0.000
7440-02-0	28	Ni	0.009	0.006	0.009	0.000	0.009	0.000	0.009	0.000
7440-50-8	29	Cu	0.009	0.006	0.009	0.000	0.009	0.000	0.009	0.000
7440-66-6	30	Zn	0.118	0.094	0.118	0.000	0.118	0.000	0.118	0.000
7726-95-6	35	Br	0.048	0.021	0.048	0.000	0.048	0.000	0.048	0.000
7439-92-1	82	Pb	0.154	0.097	0.154	0.000	0.154	0.000	0.154	0.000
	201	OC	36.400	11.284	36.400	0.000	36.400	0.000	36.400	0.000
	202	EC	18.600	12.462	18.600	0.000	18.600	0.000	18.600	0.000
TOTALS:			61.276		61.276		61.276		61.276	

(1) Estimated / extrapolated.

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PM Profile Speciation Report

Profile Name : Slash Burning (Conifer-smoldering phase)
Profile Number : 42306
Data Quality : E

Control Device : Not Applicable
Reference(s) : 26
Data Source : Samples collected 10 meters above slash fire over three 180-minute periods. Analyzed by gas chromatography.

SCC Assignments: 062, 50300201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.900	0.960	0.990

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um(1)		0-10 um(1)		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.732	0.483	0.732	0.000	0.732	0.000	0.732	0.000
7429-90-5	13	Al	0.101	0.097	0.101	0.000	0.101	0.000	0.101	0.000
7440-21-3	14	Si	0.167	0.197	0.167	0.000	0.167	0.000	0.167	0.000
7704-34-9	16	S	0.114	0.066	0.114	0.000	0.114	0.000	0.114	0.000
7782-50-5	17	Cl	0.118	0.063	0.118	0.000	0.118	0.000	0.118	0.000
7440-09-7	19	K	0.126	0.063	0.126	0.000	0.126	0.000	0.126	0.000
7440-70-2	20	Ca	0.127	0.103	0.127	0.000	0.127	0.000	0.127	0.000
7440-32-6	22	Ti	0.124	0.089	0.124	0.000	0.124	0.000	0.124	0.000
7440-62-2	23	V	0.031	0.025	0.031	0.000	0.031	0.000	0.031	0.000
7440-47-3	24	Cr	0.024	0.016	0.024	0.000	0.024	0.000	0.024	0.000
7439-96-5	25	Mn	0.020	0.017	0.020	0.000	0.020	0.000	0.020	0.000
7439-89-6	26	Fe	0.061	0.040	0.061	0.000	0.061	0.000	0.061	0.000
7440-02-0	28	Ni	0.010	0.006	0.010	0.000	0.010	0.000	0.010	0.000
7440-50-8	29	Cu	0.010	0.006	0.010	0.000	0.010	0.000	0.010	0.000
7440-66-6	30	Zn	0.016	0.010	0.016	0.000	0.016	0.000	0.016	0.000
7726-95-6	35	Br	0.025	0.013	0.025	0.000	0.025	0.000	0.025	0.000
7439-92-1	82	Pb	0.078	0.055	0.078	0.000	0.078	0.000	0.078	0.000
	201	OC	51.900	8.304	51.900	0.000	51.900	0.000	51.900	0.000
	202	EC	3.400	0.782	3.400	0.000	3.400	0.000	3.400	0.000
TOTALS:			57.184		57.184		57.184		57.184	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Slash Burning (Hardwood-flaming phase)
Profile Number : 42307
Data Quality : E

Control Device : Not Applicable
Reference(s) : 26
Data Source : Samples collected 20 meters above slash fire over three 10-minute periods. Analyzed by gas chromatography.

SCC Assignments: 062, 50300201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.900	0.960	0.990

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um(1) %wt	2.5-10 um(1) unc	0-10 um(1) %wt	0-10 um(1) unc	Total Measured(1) %wt	Total Measured(1) unc
7429-90-5	13	Al	0.280	0.434	0.280	0.000	0.280	0.000	0.280	0.000
7440-21-3	14	Si	0.427	0.521	0.427	0.000	0.427	0.000	0.427	0.000
7723-14-0	15	P	0.237	0.254	0.237	0.000	0.237	0.000	0.237	0.000
7704-34-9	16	S	1.118	1.219	1.118	0.000	1.118	0.000	1.118	0.000
7782-50-5	17	Cl	2.703	3.163	2.703	0.000	2.703	0.000	2.703	0.000
7440-09-7	19	K	5.014	6.217	5.014	0.000	5.014	0.000	5.014	0.000
7440-70-2	20	Ca	0.181	0.398	0.181	0.000	0.181	0.000	0.181	0.000
7440-32-6	22	Ti	0.019	0.029	0.019	0.000	0.019	0.000	0.019	0.000
7440-62-2	23	V	0.006	0.009	0.006	0.000	0.006	0.000	0.006	0.000
7440-47-3	24	Cr	0.018	0.043	0.018	0.000	0.018	0.000	0.018	0.000
7439-96-5	25	Mn	0.023	0.030	0.023	0.000	0.023	0.000	0.023	0.000
7439-89-6	26	Fe	0.107	0.227	0.107	0.000	0.107	0.000	0.107	0.000
7440-02-0	28	Ni	0.024	0.054	0.024	0.000	0.024	0.000	0.024	0.000
7440-50-8	29	Cu	0.021	0.037	0.021	0.000	0.021	0.000	0.021	0.000
7440-66-6	30	Zn	0.154	0.186	0.154	0.000	0.154	0.000	0.154	0.000
7726-95-6	35	Br	0.124	0.104	0.124	0.000	0.124	0.000	0.124	0.000
7440-22-4	47	Ag	0.077	0.156	0.077	0.000	0.077	0.000	0.077	0.000
7440-43-9	48	Cd	0.169	0.397	0.169	0.000	0.169	0.000	0.169	0.000
7440-31-5	50	Sn	0.086	0.169	0.086	0.000	0.086	0.000	0.086	0.000
7439-92-1	82	Pb	0.211	0.371	0.211	0.000	0.211	0.000	0.211	0.000
	201	OC	60.300	1.809	60.300	0.000	60.300	0.000	60.300	0.000
	202	EC	8.300	4.731	8.300	0.000	8.300	0.000	8.300	0.000
TOTALS:			79.599		79.599		79.599		79.599	

(1) Estimated / extrapolated.

```
PM Profile Speciation Report
-------------------------------------------------------------------------------
Profile Name   : Slash Burning (Hardwood-smoldering phase)
Profile Number : 42308
Data Quality   : E
-------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 26
Data Source    : Samples collected 10 meters above slash fire over three
                 180-minute periods.  Analyzed by gas chromatography.

SCC Assignments: 062, 50300201

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.900         0.960           0.990
-------------------------------------------------------------------------------
Total Particulate Matter -
                                                                         Total
                                 0-2.5 um     2.5-10 um(1)   0-10 um(1)    Measured(1)
                 Species       ------------  ------------  ------------  ------------
 CAS Number   Num   Sym        %wt    unc    %wt    unc    %wt    unc    %wt    unc
-------------------------------------------------------------------------------
  7429-90-5   13    Al        0.181  0.161  0.181  0.000  0.181  0.000  0.181  0.000
  7440-21-3   14    Si        0.336  0.407  0.336  0.000  0.336  0.000  0.336  0.000
  7723-14-0   15    P         0.093  0.079  0.093  0.000  0.093  0.000  0.093  0.000
  7704-34-9   16    S         0.503  0.483  0.503  0.000  0.503  0.000  0.503  0.000
  7782-50-5   17    Cl        0.468  0.225  0.468  0.000  0.468  0.000  0.468  0.000
  7440-09-7   19    K         0.577  0.565  0.577  0.000  0.577  0.000  0.577  0.000
  7440-70-2   20    Ca        0.183  0.344  0.183  0.000  0.183  0.000  0.183  0.000
  7440-32-6   22    Ti        0.013  0.013  0.013  0.000  0.013  0.000  0.013  0.000
  7440-62-2   23    V         0.004  0.006  0.004  0.000  0.004  0.000  0.004  0.000
  7440-47-3   24    Cr        0.003  0.004  0.003  0.000  0.003  0.000  0.003  0.000
  7439-96-5   25    Mn        0.011  0.013  0.011  0.000  0.011  0.000  0.011  0.000
  7439-89-6   26    Fe        0.062  0.087  0.062  0.000  0.062  0.000  0.062  0.000
  7440-02-0   28    Ni        0.003  0.004  0.003  0.000  0.003  0.000  0.003  0.000
  7440-50-8   29    Cu        0.001  0.001  0.001  0.000  0.001  0.000  0.001  0.000
  7440-66-6   30    Zn        0.014  0.018  0.014  0.000  0.014  0.000  0.014  0.000
  7726-95-6   35    Br        0.019  0.010  0.019  0.000  0.019  0.000  0.019  0.000
  7440-22-4   47    Ag        0.030  0.034  0.030  0.000  0.030  0.000  0.030  0.000
  7440-43-9   48    Cd        0.066  0.115  0.066  0.000  0.066  0.000  0.066  0.000
  7440-31-5   50    Sn        0.043  0.066  0.043  0.000  0.043  0.000  0.043  0.000
  7439-92-1   82    Pb        0.031  0.041  0.031  0.000  0.031  0.000  0.031  0.000
             201    OC       61.700  2.468 61.700  0.000 61.700  0.000 61.700  0.000
             202    EC        2.700  0.999  2.700  0.000  2.700  0.000  2.700  0.000
-------------------------------------------------------------------------------
TOTALS:                      67.041        67.041        67.041        67.041
===============================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Slash Burning (Ponderosa Pine-flaming phase)
Profile Number : 42309
Data Quality : E

Control Device : Not Applicable
Reference(s) : 26
Data Source : Samples collected 20 meters above slash fire over three 10-minute periods. Analyzed by gas chromatography.

SCC Assignments: 062, 50300201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.900	0.960	0.990

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um(1)		0-10 um(1)		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.081	0.038	0.081	0.000	0.081	0.000	0.081	0.000
7440-21-3	14	Si	0.152	0.082	0.152	0.000	0.152	0.000	0.152	0.000
7723-14-0	15	P	0.088	0.034	0.088	0.000	0.088	0.000	0.088	0.000
7704-34-9	16	S	0.556	0.295	0.556	0.000	0.556	0.000	0.556	0.000
7782-50-5	17	Cl	0.554	0.332	0.554	0.000	0.554	0.000	0.554	0.000
7440-09-7	19	K	2.103	1.157	2.103	0.000	2.103	0.000	2.103	0.000
7440-70-2	20	Ca	0.112	0.052	0.112	0.000	0.112	0.000	0.112	0.000
7440-32-6	22	Ti	0.010	0.010	0.010	0.000	0.010	0.000	0.010	0.000
7440-62-2	23	V	0.003	0.003	0.003	0.000	0.003	0.000	0.003	0.000
7440-47-3	24	Cr	0.003	0.005	0.003	0.000	0.003	0.000	0.003	0.000
7439-96-5	25	Mn	0.016	0.007	0.016	0.000	0.016	0.000	0.016	0.000
7439-89-6	26	Fe	0.010	0.008	0.010	0.000	0.010	0.000	0.010	0.000
7440-02-0	28	Ni	0.005	0.005	0.005	0.000	0.005	0.000	0.005	0.000
7440-50-8	29	Cu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-66-6	30	Zn	0.115	0.069	0.115	0.000	0.115	0.000	0.115	0.000
7726-95-6	35	Br	0.033	0.025	0.033	0.000	0.033	0.000	0.033	0.000
7440-22-4	47	Ag	0.028	0.018	0.028	0.000	0.028	0.000	0.028	0.000
7440-43-9	48	Cd	0.045	0.048	0.045	0.000	0.045	0.000	0.045	0.000
7440-31-5	50	Sn	0.013	0.015	0.013	0.000	0.013	0.000	0.013	0.000
7439-92-1	82	Pb	0.068	0.068	0.068	0.000	0.068	0.000	0.068	0.000
	201	OC	55.100	3.857	55.100	0.000	55.100	0.000	55.100	0.000
	202	EC	10.900	5.559	10.900	0.000	10.900	0.000	10.900	0.000
TOTALS:			69.995		69.995		69.995		69.995	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Slash Burning (Ponderosa Pine-smoldering phase)
Profile Number : 42310
Data Quality : E

Control Device : Not Applicable
Reference(s) : 26
Data Source : Samples collected 10 meters above slash fire over three 180-minute periods. Analyzed by gas chromatography.

SCC Assignments: 062, 50300201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.900	0.960	0.990

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um(1)		0-10 um(1)		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.105	0.069	0.105	0.000	0.105	0.000	0.105	0.000
7440-21-3	14	Si	0.148	0.170	0.148	0.000	0.148	0.000	0.148	0.000
7723-14-0	15	P	0.048	0.023	0.048	0.000	0.048	0.000	0.048	0.000
7704-34-9	16	S	0.162	0.110	0.162	0.000	0.162	0.000	0.162	0.000
7782-50-5	17	Cl	0.226	0.167	0.226	0.000	0.226	0.000	0.226	0.000
7440-09-7	19	K	0.501	0.396	0.501	0.000	0.501	0.000	0.501	0.000
7440-70-2	20	Ca	0.073	0.094	0.073	0.000	0.073	0.000	0.073	0.000
7440-32-6	22	Ti	0.005	0.008	0.005	0.000	0.005	0.000	0.005	0.000
7440-62-2	23	V	0.002	0.002	0.002	0.000	0.002	0.000	0.002	0.000
7440-47-3	24	Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-96-5	25	Mn	0.008	0.008	0.008	0.000	0.008	0.000	0.008	0.000
7439-89-6	26	Fe	0.057	0.094	0.057	0.000	0.057	0.000	0.057	0.000
7440-02-0	28	Ni	0.002	0.001	0.002	0.000	0.002	0.000	0.002	0.000
7440-50-8	29	Cu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-66-6	30	Zn	0.025	0.019	0.025	0.000	0.025	0.000	0.025	0.000
7726-95-6	35	Br	0.008	0.005	0.008	0.000	0.008	0.000	0.008	0.000
7440-22-4	47	Ag	0.018	0.013	0.018	0.000	0.018	0.000	0.018	0.000
7440-43-9	48	Cd	0.014	0.010	0.014	0.000	0.014	0.000	0.014	0.000
7440-31-5	50	Sn	0.018	0.014	0.018	0.000	0.018	0.000	0.018	0.000
7439-92-1	82	Pb	0.019	0.013	0.019	0.000	0.019	0.000	0.019	0.000
	201	OC	61.000	3.050	61.000	0.000	61.000	0.000	61.000	0.000
	202	EC	4.100	1.107	4.100	0.000	4.100	0.000	4.100	0.000
TOTALS:			66.539		66.539		66.539		66.539	

(1) Estimated / extrapolated.

```
PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Slash Burning (Tractor-piled;flaming phase)
Profile Number : 42311
Data Quality   : E
------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 26
Data Source    : Samples collected 20 meters above slash fire over three
                 10-minute periods.  Analyzed by gas chromatography.

SCC Assignments: 062, 50300201

Mass Fraction Data -  Size Interval (um) :    (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :     0.900         0.960          0.990
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                              0-2.5 um     2.5-10 um(1)   0-10 um(1)    Measured(1)
             Species        ------------  ------------  ------------  ------------
 CAS Number  Num   Sym        %wt    unc    %wt    unc    %wt    unc    %wt    unc
------------------------------------------------------------------------------
  7429-90-5   13   Al       0.181  0.083  0.181  0.000  0.181  0.000  0.181  0.000
  7440-21-3   14   Si       0.348  0.115  0.348  0.000  0.348  0.000  0.348  0.000
  7723-14-0   15   P        0.128  0.040  0.128  0.000  0.128  0.000  0.128  0.000
  7704-34-9   16   S        0.950  0.504  0.950  0.000  0.950  0.000  0.950  0.000
  7782-50-5   17   Cl       0.921  0.341  0.921  0.000  0.921  0.000  0.921  0.000
  7440-09-7   19   K        3.895  2.298  3.895  0.000  3.895  0.000  3.895  0.000
  7440-70-2   20   Ca       0.619  0.142  0.619  0.000  0.619  0.000  0.619  0.000
  7440-32-6   22   Ti       0.018  0.017  0.018  0.000  0.018  0.000  0.018  0.000
  7440-62-2   23   V        0.007  0.006  0.007  0.000  0.007  0.000  0.007  0.000
  7440-47-3   24   Cr       0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
  7439-96-5   25   Mn       0.045  0.030  0.045  0.000  0.045  0.000  0.045  0.000
  7439-89-6   26   Fe       0.030  0.020  0.030  0.000  0.030  0.000  0.030  0.000
  7440-02-0   28   Ni       0.011  0.013  0.011  0.000  0.011  0.000  0.011  0.000
  7440-50-8   29   Cu       0.007  0.009  0.007  0.000  0.007  0.000  0.007  0.000
  7440-66-6   30   Zn       0.389  0.222  0.389  0.000  0.389  0.000  0.389  0.000
  7726-95-6   35   Br       0.146  0.105  0.146  0.000  0.146  0.000  0.146  0.000
  7440-22-4   47   Ag       0.172  0.127  0.172  0.000  0.172  0.000  0.172  0.000
  7440-43-9   48   Cd       0.066  0.104  0.066  0.000  0.066  0.000  0.066  0.000
  7440-31-5   50   Sn       0.196  0.182  0.196  0.000  0.196  0.000  0.196  0.000
  7439-92-1   82   Pb       0.234  0.201  0.234  0.000  0.234  0.000  0.234  0.000
             201   OC      49.000  5.390 49.000  0.000 49.000  0.000 49.000  0.000
             202   EC       8.200  3.690  8.200  0.000  8.200  0.000  8.200  0.000
------------------------------------------------------------------------------
TOTALS:                    65.563        65.563        65.563        65.563
==============================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Slash Burning (Tractor-piled;smoldering phase)
Profile Number : 42312
Data Quality : E

Control Device : Not Applicable
Reference(s) : 26
Data Source : Samples collected 10 meters above slash fire over three 180-minute periods. Analyzed by gas chromatography.

SCC Assignments: 062, 50300201

Mass Fraction Data -				
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.900	0.960	0.990

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um(1)		0-10 um(1)		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.056	0.007	0.056	0.000	0.056	0.000	0.056	0.000
7440-21-3	14	Si	0.052	0.024	0.052	0.000	0.052	0.000	0.052	0.000
7723-14-0	15	P	0.039	0.007	0.039	0.000	0.039	0.000	0.039	0.000
7704-34-9	16	S	0.228	0.043	0.228	0.000	0.228	0.000	0.228	0.000
7782-50-5	17	Cl	0.227	0.018	0.227	0.000	0.227	0.000	0.227	0.000
7440-09-7	19	K	0.606	0.188	0.606	0.000	0.606	0.000	0.606	0.000
7440-70-2	20	Ca	0.071	0.011	0.071	0.000	0.071	0.000	0.071	0.000
7440-32-6	22	Ti	0.002	0.002	0.002	0.000	0.002	0.000	0.002	0.000
7440-62-2	23	V	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000
7440-47-3	24	Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-96-5	25	Mn	0.005	0.003	0.005	0.000	0.005	0.000	0.005	0.000
7439-89-6	26	Fe	0.003	0.005	0.003	0.000	0.003	0.000	0.003	0.000
7440-02-0	28	Ni	0.027	0.045	0.027	0.000	0.027	0.000	0.027	0.000
7440-50-8	29	Cu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-66-6	30	Zn	0.012	0.005	0.012	0.000	0.012	0.000	0.012	0.000
7726-95-6	35	Br	0.012	0.003	0.012	0.000	0.012	0.000	0.012	0.000
7440-22-4	47	Ag	0.008	0.010	0.008	0.000	0.008	0.000	0.008	0.000
7440-43-9	48	Cd	0.015	0.022	0.015	0.000	0.015	0.000	0.015	0.000
7440-31-5	50	Sn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	0.010	0.004	0.010	0.000	0.010	0.000	0.010	0.000
	201	OC	53.100	2.124	53.100	0.000	53.100	0.000	53.100	0.000
	202	EC	2.900	1.421	2.900	0.000	2.900	0.000	2.900	0.000
TOTALS:			57.374		57.374		57.374		57.374	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Slash Burning (Crane-piled;flaming phase)
Profile Number : 42313
Data Quality : E

Control Device : Not Applicable
Reference(s) : 26
Data Source : Samples collected 20 meters above slash fire over three 10-minute periods. Analyzed by gas chromatography.

SCC Assignments: 062, 50300201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.900	0.960	0.990

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um(1)		0-10 um(1)		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.025	0.009	0.025	0.000	0.025	0.000	0.025	0.000
7440-21-3	14	Si	0.016	0.032	0.016	0.000	0.016	0.000	0.016	0.000
7723-14-0	15	P	0.011	0.004	0.011	0.000	0.011	0.000	0.011	0.000
7704-34-9	16	S	0.229	0.034	0.229	0.000	0.229	0.000	0.229	0.000
7782-50-5	17	Cl	0.196	0.025	0.196	0.000	0.196	0.000	0.196	0.000
7440-09-7	19	K	1.195	0.215	1.195	0.000	1.195	0.000	1.195	0.000
7440-70-2	20	Ca	0.074	0.019	0.074	0.000	0.074	0.000	0.074	0.000
7440-32-6	22	Ti	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000
7440-62-2	23	V	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000
7440-47-3	24	Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-96-5	25	Mn	0.019	0.005	0.019	0.000	0.019	0.000	0.019	0.000
7439-89-6	26	Fe	0.006	0.004	0.006	0.000	0.006	0.000	0.006	0.000
7440-02-0	28	Ni	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-50-8	29	Cu	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000
7440-66-6	30	Zn	0.054	0.020	0.054	0.000	0.054	0.000	0.054	0.000
7726-95-6	35	Br	0.004	0.003	0.004	0.000	0.004	0.000	0.004	0.000
7440-22-4	47	Ag	0.005	0.004	0.005	0.000	0.005	0.000	0.005	0.000
7440-43-9	48	Cd	0.001	0.002	0.001	0.000	0.001	0.000	0.001	0.000
7440-31-5	50	Sn	0.005	0.010	0.005	0.000	0.005	0.000	0.005	0.000
7439-92-1	82	Pb	0.007	0.008	0.007	0.000	0.007	0.000	0.007	0.000
	201	OC	59.800	4.186	59.800	0.000	59.800	0.000	59.800	0.000
	202	EC	2.300	0.345	2.300	0.000	2.300	0.000	2.300	0.000
TOTALS:			63.950		63.950		63.950		63.950	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Slash Burning (Crane-piled;smoldering phase)
Profile Number : 42314
Data Quality : E

Control Device : Not Applicable
Reference(s) : 26
Data Source : Samples collected 10 meters above slash fire over three 180-minute periods. Analyzed by gas chromatography.

SCC Assignments: 062, 50300201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.900	0.960	0.990

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um(1)		0-10 um(1)		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.013	0.008	0.013	0.000	0.013	0.000	0.013	0.000
7440-21-3	14	Si	0.013	0.012	0.013	0.000	0.013	0.000	0.013	0.000
7723-14-0	15	P	0.007	0.004	0.007	0.000	0.007	0.000	0.007	0.000
7704-34-9	16	S	0.125	0.051	0.125	0.000	0.125	0.000	0.125	0.000
7782-50-5	17	Cl	0.107	0.046	0.107	0.000	0.107	0.000	0.107	0.000
7440-09-7	19	K	0.818	0.335	0.818	0.000	0.818	0.000	0.818	0.000
7440-70-2	20	Ca	0.077	0.018	0.077	0.000	0.077	0.000	0.077	0.000
7440-32-6	22	Ti	0.002	0.001	0.002	0.000	0.002	0.000	0.002	0.000
7440-62-2	23	V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-47-3	24	Cr	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000
7439-96-5	25	Mn	0.018	0.006	0.018	0.000	0.018	0.000	0.018	0.000
7439-89-6	26	Fe	0.007	0.002	0.007	0.000	0.007	0.000	0.007	0.000
7440-02-0	28	Ni	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-50-8	29	Cu	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000
7440-66-6	30	Zn	0.012	0.004	0.012	0.000	0.012	0.000	0.012	0.000
7726-95-6	35	Br	0.002	0.002	0.002	0.000	0.002	0.000	0.002	0.000
7440-22-4	47	Ag	0.004	0.005	0.004	0.000	0.004	0.000	0.004	0.000
7440-43-9	48	Cd	0.004	0.003	0.004	0.000	0.004	0.000	0.004	0.000
7440-31-5	50	Sn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	0.003	0.002	0.003	0.000	0.003	0.000	0.003	0.000
	201	OC	60.400	2.416	60.400	0.000	60.400	0.000	60.400	0.000
	202	EC	1.100	0.363	1.100	0.000	1.100	0.000	1.100	0.000
TOTALS:			62.714		62.714		62.714		62.714	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Slash Burning (Chaparral;flaming phase)
Profile Number : 42315
Data Quality : E

Control Device : Not Applicable
Reference(s) : 26
Data Source : Samples collected 20 meters above slash fire over three 10-minute periods. Analyzed by gas chromatography.

SCC Assignments: 062, 50300201

Mass Fraction Data -			
Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
Mass Fraction :	0.900	0.960	0.990

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um(1)		0-10 um(1)		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.261	0.227	0.261	0.000	0.261	0.000	0.261	0.000
7440-21-3	14	Si	0.699	0.377	0.699	0.000	0.699	0.000	0.699	0.000
7723-14-0	15	P	0.209	0.056	0.209	0.000	0.209	0.000	0.209	0.000
7704-34-9	16	S	2.297	0.850	2.297	0.000	2.297	0.000	2.297	0.000
7782-50-5	17	Cl	4.323	1.686	4.323	0.000	4.323	0.000	4.323	0.000
7440-09-7	19	K	9.896	3.563	9.896	0.000	9.896	0.000	9.896	0.000
7440-70-2	20	Ca	0.581	0.308	0.581	0.000	0.581	0.000	0.581	0.000
7440-32-6	22	Ti	0.015	0.013	0.015	0.000	0.015	0.000	0.015	0.000
7440-62-2	23	V	0.004	0.005	0.004	0.000	0.004	0.000	0.004	0.000
7440-47-3	24	Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-96-5	25	Mn	0.010	0.006	0.010	0.000	0.010	0.000	0.010	0.000
7439-89-6	26	Fe	0.121	0.071	0.121	0.000	0.121	0.000	0.121	0.000
7440-02-0	28	Ni	0.002	0.001	0.002	0.000	0.002	0.000	0.002	0.000
7440-50-8	29	Cu	0.003	0.001	0.003	0.000	0.003	0.000	0.003	0.000
7440-66-6	30	Zn	0.181	0.056	0.181	0.000	0.181	0.000	0.181	0.000
7726-95-6	35	Br	0.110	0.057	0.110	0.000	0.110	0.000	0.110	0.000
7440-22-4	47	Ag	0.097	0.082	0.097	0.000	0.097	0.000	0.097	0.000
7440-43-9	48	Cd	0.055	0.043	0.055	0.000	0.055	0.000	0.055	0.000
7440-31-5	50	Sn	0.031	0.024	0.031	0.000	0.031	0.000	0.031	0.000
7439-92-1	82	Pb	0.425	0.157	0.425	0.000	0.425	0.000	0.425	0.000
	201	OC	48.000	3.360	48.000	0.000	48.000	0.000	48.000	0.000
	202	EC	9.200	4.784	9.200	0.000	9.200	0.000	9.200	0.000
TOTALS:			76.520		76.520		76.520		76.520	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Slash Burning (Chaparral;smoldering phase)
Profile Number : 42316
Data Quality : E

Control Device : Not Applicable
Reference(s) : 26
Data Source : Samples collected 10 meters above slash fire over three 180-minute periods. Analyzed by gas chromatography.

SCC Assignments: 062, 50300201

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.900	0.960	0.990

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um(1) %wt	2.5-10 um(1) unc	0-10 um(1) %wt	0-10 um(1) unc	Total Measured(1) %wt	Total Measured(1) unc
7429-90-5	13	Al	0.077	0.000	0.077	0.000	0.077	0.000	0.077	0.000
7440-21-3	14	Si	0.238	0.000	0.238	0.000	0.238	0.000	0.238	0.000
7723-14-0	15	P	0.096	0.000	0.096	0.000	0.096	0.000	0.096	0.000
7704-34-9	16	S	0.838	0.000	0.838	0.000	0.838	0.000	0.838	0.000
7782-50-5	17	Cl	1.549	0.000	1.549	0.000	1.549	0.000	1.549	0.000
7440-09-7	19	K	3.988	0.000	3.988	0.000	3.988	0.000	3.988	0.000
7440-70-2	20	Ca	0.268	0.000	0.268	0.000	0.268	0.000	0.268	0.000
7440-32-6	22	Ti	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.000
7440-62-2	23	V	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000
7440-47-3	24	Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-96-5	25	Mn	0.014	0.000	0.014	0.000	0.014	0.000	0.014	0.000
7439-89-6	26	Fe	0.020	0.000	0.020	0.000	0.020	0.000	0.020	0.000
7440-02-0	28	Ni	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-50-8	29	Cu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-66-6	30	Zn	0.040	0.000	0.040	0.000	0.040	0.000	0.040	0.000
7726-95-6	35	Br	0.035	0.000	0.035	0.000	0.035	0.000	0.035	0.000
7440-22-4	47	Ag	0.026	0.000	0.026	0.000	0.026	0.000	0.026	0.000
7440-43-9	48	Cd	0.015	0.000	0.015	0.000	0.015	0.000	0.015	0.000
7440-31-5	50	Sn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	0.082	0.000	0.082	0.000	0.082	0.000	0.082	0.000
	201	OC	63.900	0.000	63.900	0.000	63.900	0.000	63.900	0.000
	202	EC	7.800	0.000	7.800	0.000	7.800	0.000	7.800	0.000
TOTALS:			78.999		78.999		78.999		78.999	

(1) Estimated / extrapolated.

```
PM Profile Speciation Report
-----------------------------------------------------------------------------
Profile Name   : Wood Combustion - Las Vegas Valley (1987)
Profile Number : 42317
Data Quality   : C
-----------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 20,27
Data Source    : Samples collected with two dichotomous samplers. Analyzed
                 using sequential thermal oxidation and XRF.

SCC Assignments: 006

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)        (0-10)
                      Mass Fraction      :      1.000         1.000         1.000
-----------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                               0-2.5 um      2.5-10 um      0-10 um    Measured(1)
                 Species     ------------  ------------  ------------  ------------
  CAS Number   Num   Sym     %wt    unc    %wt    unc    %wt    unc    %wt    unc
-----------------------------------------------------------------------------
   7429-90-5    13   Al     0.300  0.030  0.000  0.000  0.300  0.000  0.300  0.000
   7440-21-3    14   Si     0.800  0.080  0.000  0.000  0.800  0.000  0.800  0.000
   7704-34-9    16   S      1.010  0.100  0.000  0.000  1.010  0.000  1.010  0.000
   7782-50-5    17   Cl     0.250  0.025  0.000  0.000  0.250  0.000  0.250  0.000
   7440-09-7    19   K      0.870  0.100  0.000  0.000  0.870  0.000  0.870  0.000
   7439-92-1    82   Pb     0.250  0.025  0.000  0.000  0.250  0.000  0.250  0.000
               200   TC    61.000 10.000  0.000  0.000 61.000  0.000 61.000  0.000
-----------------------------------------------------------------------------
TOTALS:                    64.480         0.000        64.480        64.480
=============================================================================
(1)  Only data in the 0 - 2.5 um range were measured.
```

PM Profile Speciation Report

Profile Name : Residential Wood Combustion
Profile Number : 2318
Data Quality : C

Control Device : Uncontrolled
Reference(s) : 1,28
Data Source : Data taken from Reference 1. For details, consult Reference 28.

SCC Assignments: 006

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	1.000	1.000	1.000

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.083	0.012	0.000	0.000	0.083	0.017	0.083	0.000
7439-95-4	12	Mg	0.073	0.017	0.000	0.000	0.073	0.020	0.073	0.000
7429-90-5	13	Al	0.021	0.010	0.000	0.000	0.021	0.010	0.021	0.000
7704-34-9	16	S	0.182	0.019	0.000	0.000	0.182	0.032	0.182	0.000
7782-50-5	17	Cl	0.509	0.031	0.000	0.000	0.509	0.078	0.509	0.000
7440-09-7	19	K	0.860	0.096	0.000	0.000	0.860	0.155	0.860	0.000
7440-70-2	20	Ca	0.067	0.006	0.000	0.000	0.067	0.011	0.067	0.000
7440-66-6	30	Zn	0.037	0.002	0.000	0.000	0.037	0.006	0.037	0.000
	201	OC	47.500	13.800	0.000	0.000	47.500	15.348	47.500	0.000
	202	EC	12.800	8.400	0.000	0.000	12.800	8.593	12.800	0.000
	203	SO4	0.289	0.021	0.000	0.000	0.289	0.046	0.289	0.000
TOTALS:			62.421		0.000		62.421		62.421	

(1) Only data in the 0 - 2.5 um range were measured.

```
PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Residential Wood Combustion Composite
Profile Number : 42319
Data Quality   : C
------------------------------------------------------------------------------
Control Device : Uncontrolled
Reference(s)   :
Data Source    : Profile represents a composite of Profiles 42317 and 42318
                 for the elements AL, S, CL, and K.

SCC Assignments: 006

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)         (0-10)
                      Mass Fraction      :      1.000         1.000          1.000
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                         Total
                                0-2.5 um      2.5-10 um      0-10 um    Measured(2)
                 Species      ------------  ------------  ------------  ------------
 CAS Number   Num   Sym       %wt  unc(1)   %wt  unc(1)   %wt  unc(1)   %wt  unc(1)
------------------------------------------------------------------------------
  7429-90-5    13   Al       0.161  0.000  0.000  0.000  0.161  0.000  0.161  0.000
  7704-34-9    16   S        0.596  0.000  0.000  0.000  0.596  0.000  0.596  0.000
  7782-50-5    17   Cl       0.380  0.000  0.000  0.000  0.380  0.000  0.380  0.000
  7440-09-7    19   K        0.865  0.000  0.000  0.000  0.865  0.000  0.865  0.000
------------------------------------------------------------------------------
TOTALS:                      2.002         0.000         2.002         2.002
==============================================================================
(1)  Uncertainty not evaluated.
(2)  Only data in the 0 - 2.5 um range was measured.
```

3.13 MOBILE SOURCES

Because of their widespread use, the internal combustion gasoline and diesel powered engines in mobile applications are major sources of PM emissions. Automotive PM emissions typically consist of exhaust emissions that occur from the tailpipe. Particulate emissions, however, can also be generated from brake and tire wear.

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PM Profile Speciation Report

Profile Name : Light Duty Vehicles - Leaded
Profile Number : 31103
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Vehicle exhaust gases sampled with a dilution sampler and constant volume sampling system. Analyzed using XRF and flame ionization.

SCC Assignments: 035, 036, 037, 038

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.450	0.580	0.640

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.642	0.642	0.342	0.699	0.599	0.744	0.599	0.000
7440-21-3	14	Si	0.786	0.460	0.282	0.201	0.720	0.375	0.720	0.000
7723-14-0	15	P	0.167	0.180	0.122	0.122	0.168	0.165	0.168	0.000
7704-34-9	16	S	0.000	1.208	0.000	2.164	0.000	2.004	0.000	0.000
7782-50-5	17	Cl	0.262	0.262	0.000	0.336	0.238	0.338	0.238	0.000
7440-09-7	19	K	0.051	0.025	0.013	0.024	0.045	0.028	0.045	0.000
7440-70-2	20	Ca	0.092	0.029	0.295	0.151	0.107	0.134	0.107	0.000
7440-32-6	22	Ti	0.004	0.002	0.017	0.021	0.004	0.019	0.004	0.000
7440-62-2	23	V	0.002	0.002	0.004	0.008	0.002	0.008	0.002	0.000
7440-47-3	24	Cr	0.001	0.002	0.033	0.011	0.006	0.014	0.006	0.000
7439-96-5	25	Mn	0.987	0.612	1.205	0.304	0.956	0.520	0.956	0.000
7439-89-6	26	Fe	0.111	0.045	0.849	0.230	0.198	0.211	0.198	0.000
7440-02-0	28	Ni	0.012	0.005	0.026	0.007	0.013	0.012	0.013	0.000
7440-50-8	29	Cu	0.026	0.006	0.039	0.008	0.028	0.014	0.028	0.000
7440-66-6	30	Zn	0.148	0.040	0.392	0.085	0.181	0.090	0.181	0.000
7440-55-3	31	Ga	0.031	0.041	0.005	0.075	0.024	0.069	0.024	0.000
7440-38-2	33	As	0.009	0.698	0.000	1.262	0.009	1.166	0.009	0.000
7782-49-2	34	Se	0.000	0.006	0.007	0.011	0.003	0.011	0.003	0.000
7726-95-6	35	Br	6.183	2.113	6.147	2.212	6.021	2.496	6.021	0.000
7440-17-7	37	Rb	0.005	0.046	0.000	0.087	0.005	0.080	0.005	0.000
7440-24-6	38	Sr	0.000	0.005	0.000	0.008	0.000	0.007	0.000	0.000
7440-65-5	39	Y	0.000	0.041	0.000	0.083	0.000	0.076	0.000	0.000
7440-67-7	40	Zr	0.000	0.022	0.000	0.028	0.000	0.028	0.000	0.000
7439-98-7	42	Mo	0.000	0.011	0.000	0.010	0.000	0.011	0.000	0.000
7440-05-3	46	Pd	0.000	0.012	0.000	0.023	0.000	0.021	0.000	0.000
7440-22-4	47	Ag	0.000	0.015	0.000	0.014	0.000	0.015	0.000	0.000
7440-43-9	48	Cd	0.000	0.020	0.000	0.046	0.000	0.041	0.000	0.000
7440-74-6	49	In	0.000	0.024	0.000	0.022	0.000	0.025	0.000	0.000
7440-31-5	50	Sn	0.000	0.029	0.000	0.040	0.000	0.039	0.000	0.000
7440-36-0	51	Sb	0.000	0.064	0.000	0.055	0.000	0.065	0.000	0.000
7440-39-3	56	Ba	0.000	0.120	0.000	0.103	0.000	0.120	0.000	0.000
7439-91-0	57	La	0.000	0.220	0.000	0.190	0.000	0.222	0.000	0.000
7439-97-6	80	Hg	0.002	0.005	0.014	0.008	0.003	0.010	0.003	0.000
7439-92-1	82	Pb	21.649	7.650	30.631	6.884	23.122	8.463	23.122	0.000

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PM Profile Speciation Report - continued (profile 31103)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um %wt	0-10 um unc	Total Measured(1) %wt	Total Measured(1) unc
	201	OC	31.374	19.838	3.768	3.309	28.900	14.563	28.900	0.000
	202	EC	15.053	2.434	7.220	5.538	12.736	5.198	12.736	0.000
TOTALS:			77.597		51.411		74.088		74.088	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Light Duty Vehicles - Leaded
Profile Number : 31104
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Vehicle exhaust gases sampled with a dilution sampler and constant volume sampling system. Analyzed using XRF and flame ionization.

SCC Assignments: 035, 036, 037, 038

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.450	0.580	0.640

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.670	1.146	0.693	1.172	0.492	1.274	0.492	0.000
7440-21-3	14	Si	1.588	0.641	0.199	0.191	1.335	0.504	1.335	0.000
7723-14-0	15	P	0.435	0.135	0.070	0.165	0.374	0.174	0.374	0.000
7704-34-9	16	S	0.022	0.908	0.000	1.439	0.016	1.365	0.016	0.000
7782-50-5	17	Cl	0.051	0.155	0.058	0.234	0.062	0.225	0.062	0.000
7440-09-7	19	K	0.133	0.057	0.028	0.023	0.112	0.047	0.112	0.000
7440-70-2	20	Ca	0.102	0.058	0.149	0.175	0.103	0.154	0.103	0.000
7440-32-6	22	Ti	0.003	0.009	0.008	0.061	0.003	0.052	0.003	0.000
7440-62-2	23	V	0.004	0.007	0.007	0.025	0.004	0.022	0.004	0.000
7440-47-3	24	Cr	0.001	0.007	0.034	0.020	0.007	0.020	0.007	0.000
7439-96-5	25	Mn	1.345	0.878	0.303	0.189	1.169	0.653	1.169	0.000
7439-89-6	26	Fe	0.020	0.025	0.065	0.064	0.023	0.059	0.023	0.000
7440-02-0	28	Ni	0.014	0.007	0.020	0.018	0.014	0.018	0.014	0.000
7440-50-8	29	Cu	0.031	0.009	0.011	0.011	0.027	0.013	0.027	0.000
7440-66-6	30	Zn	0.109	0.015	0.084	0.078	0.098	0.070	0.098	0.000
7440-55-3	31	Ga	0.038	0.032	0.005	0.050	0.031	0.048	0.031	0.000
7440-38-2	33	As	0.182	0.505	0.000	0.829	0.133	0.780	0.133	0.000
7782-49-2	34	Se	0.000	0.008	0.005	0.009	0.001	0.010	0.001	0.000
7726-95-6	35	Br	10.365	1.186	1.429	1.187	8.445	1.663	8.445	0.000
7440-17-7	37	Rb	0.000	0.068	0.000	0.088	0.000	0.087	0.000	0.000
7440-24-6	38	Sr	0.000	0.013	0.000	0.010	0.000	0.012	0.000	0.000
7440-65-5	39	Y	0.001	0.035	0.000	0.051	0.001	0.050	0.001	0.000
7440-67-7	40	Zr	0.000	0.072	0.000	0.048	0.000	0.065	0.000	0.000
7439-98-7	42	Mo	0.000	0.042	0.000	0.028	0.000	0.038	0.000	0.000
7440-05-3	46	Pd	0.000	0.044	0.000	0.028	0.000	0.039	0.000	0.000
7440-22-4	47	Ag	0.000	0.058	0.000	0.037	0.000	0.051	0.000	0.000
7440-43-9	48	Cd	0.000	0.076	0.000	0.048	0.000	0.067	0.000	0.000
7440-74-6	49	In	0.000	0.094	0.000	0.060	0.000	0.083	0.000	0.000
7440-31-5	50	Sn	0.000	0.115	0.000	0.073	0.000	0.101	0.000	0.000
7440-36-0	51	Sb	0.000	0.253	0.000	0.160	0.000	0.223	0.000	0.000
7440-39-3	56	Ba	0.000	0.476	0.000	0.302	0.000	0.420	0.000	0.000
7439-91-0	57	La	0.000	0.868	0.000	0.548	0.000	0.764	0.000	0.000
7439-97-6	80	Hg	0.001	0.010	0.016	0.017	0.003	0.017	0.003	0.000
7439-92-1	82	Pb	17.992	1.886	3.706	2.979	15.056	3.358	15.056	0.000

PM Profile Speciation Report - continued (profile 31104)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um %wt	0-10 um unc	Total Measured(1) %wt	Total Measured(1) unc
	201	OC	51.847	4.424	13.791	12.363	48.988	12.029	48.988	0.000
	202	EC	1.322	1.030	1.429	2.259	1.297	2.036	1.297	0.000
TOTALS:			86.276		22.110		77.794		77.794	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Light Duty Vehicles - Leaded Composite
Profile Number : 31105
Data Quality : C

Control Device : Not Applicable
Reference(s) :
Data Source : Profile represents a composite of Profiles 31103 and 31104.

SCC Assignments: 035, 036, 037, 038

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
Size Interval (um) :		(0-2.5)	(0-6)	(0-10)
Mass Fraction :		0.450	0.580	0.640

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured	
CAS Number	Num	Sym	%wt	unc(1)	%wt	unc(1)	%wt	unc(1)	%wt	unc(1)
7429-90-5	13	Al	0.656	0.000	0.518	0.000	0.546	0.000	0.546	0.000
7440-21-3	14	Si	1.187	0.000	0.241	0.000	1.028	0.000	1.028	0.000
7723-14-0	15	P	0.301	0.000	0.096	0.000	0.271	0.000	0.271	0.000
7704-34-9	16	S	0.011	0.000	0.000	0.000	0.008	0.000	0.008	0.000
7782-50-5	17	Cl	0.157	0.000	0.029	0.000	0.150	0.000	0.150	0.000
7440-09-7	19	K	0.092	0.000	0.021	0.000	0.079	0.000	0.079	0.000
7440-70-2	20	Ca	0.097	0.000	0.222	0.000	0.105	0.000	0.105	0.000
7440-32-6	22	Ti	0.004	0.000	0.013	0.000	0.004	0.000	0.004	0.000
7440-62-2	23	V	0.003	0.000	0.006	0.000	0.003	0.000	0.003	0.000
7440-47-3	24	Cr	0.001	0.000	0.034	0.000	0.007	0.000	0.007	0.000
7439-96-5	25	Mn	1.166	0.000	0.754	0.000	1.063	0.000	1.063	0.000
7439-89-6	26	Fe	0.066	0.000	0.457	0.000	0.111	0.000	0.111	0.000
7440-02-0	28	Ni	0.013	0.000	0.023	0.000	0.014	0.000	0.014	0.000
7440-50-8	29	Cu	0.029	0.000	0.025	0.000	0.028	0.000	0.028	0.000
7440-66-6	30	Zn	0.129	0.000	0.238	0.000	0.140	0.000	0.140	0.000
7440-55-3	31	Ga	0.035	0.000	0.005	0.000	0.028	0.000	0.028	0.000
7440-38-2	33	As	0.096	0.000	0.000	0.000	0.071	0.000	0.071	0.000
7782-49-2	34	Se	0.000	0.000	0.006	0.000	0.002	0.000	0.002	0.000
7726-95-6	35	Br	8.274	0.000	3.788	0.000	7.233	0.000	7.233	0.000
7440-17-7	37	Rb	0.003	0.000	0.000	0.000	0.003	0.000	0.003	0.000
7440-24-6	38	Sr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-65-5	39	Y	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.000
7440-67-7	40	Zr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-98-7	42	Mo	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-05-3	46	Pd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-22-4	47	Ag	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-74-6	49	In	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-31-5	50	Sn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-91-0	57	La	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-97-6	80	Hg	0.002	0.000	0.015	0.000	0.003	0.000	0.003	0.000
7439-92-1	82	Pb	19.821	0.000	17.169	0.000	19.089	0.000	19.089	0.000
	201	OC	41.611	0.000	8.780	0.000	38.944	0.000	38.944	0.000
	202	EC	8.188	0.000	4.325	0.000	7.017	0.000	7.017	0.000
TOTALS:			81.943		36.765		75.948		75.948	

(1) Uncertainty not evaluated.

PM Profile Speciation Report

Profile Name : Light Duty Vehicles - Unleaded
Profile Number : 31202
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Vehicle exhaust gases sampled with a dilution sampler and constant volume sampling system. Analyzed using XRF and flame ionization.

SCC Assignments: 027, 028, 029, 030

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.890	0.930	0.970

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.699	0.281	1.129	0.375	0.815	0.473	0.815	0.000
7440-21-3	14	Si	3.427	1.755	0.856	0.350	2.793	1.708	2.793	0.000
7723-14-0	15	P	0.441	0.164	0.305	0.088	0.373	0.191	0.373	0.000
7704-34-9	16	S	3.255	2.025	0.534	0.223	2.830	1.919	2.830	0.000
7782-50-5	17	Cl	0.066	0.034	0.068	0.031	0.071	0.050	0.071	0.000
7440-09-7	19	K	0.011	0.008	0.037	0.011	0.020	0.022	0.020	0.000
7440-70-2	20	Ca	0.526	0.141	0.448	0.137	0.479	0.210	0.479	0.000
7440-32-6	22	Ti	0.004	0.002	0.019	0.006	0.007	0.014	0.007	0.000
7440-62-2	23	V	0.022	0.011	0.006	0.003	0.017	0.013	0.017	0.000
7440-47-3	24	Cr	0.005	0.004	0.037	0.009	0.013	0.020	0.013	0.000
7439-96-5	25	Mn	0.004	0.003	0.053	0.013	0.016	0.025	0.016	0.000
7439-89-6	26	Fe	0.421	0.124	1.178	0.309	0.583	0.353	0.583	0.000
7440-02-0	28	Ni	0.000	0.000	0.020	0.005	0.005	0.014	0.005	0.000
7440-50-8	29	Cu	0.031	0.024	0.028	0.007	0.026	0.028	0.026	0.000
7440-66-6	30	Zn	0.592	0.263	0.485	0.149	0.509	0.300	0.509	0.000
7440-55-3	31	Ga	0.001	0.001	0.002	0.003	0.001	0.005	0.001	0.000
7440-38-2	33	As	0.000	0.000	0.000	0.035	0.000	0.033	0.000	0.000
7782-49-2	34	Se	0.000	0.000	0.007	0.003	0.002	0.008	0.002	0.000
7726-95-6	35	Br	0.249	0.114	0.109	0.040	0.200	0.120	0.200	0.000
7440-17-7	37	Rb	0.000	0.000	0.000	0.004	0.000	0.003	0.000	0.000
7440-24-6	38	Sr	0.000	0.000	0.000	0.004	0.000	0.004	0.000	0.000
7440-65-5	39	Y	0.000	0.000	0.000	0.005	0.000	0.005	0.000	0.000
7440-67-7	40	Zr	0.000	0.000	0.000	0.021	0.000	0.020	0.000	0.000
7439-98-7	42	Mo	0.000	0.000	0.000	0.013	0.000	0.012	0.000	0.000
7440-05-3	46	Pd	0.000	0.000	0.000	0.013	0.000	0.013	0.000	0.000
7440-22-4	47	Ag	0.000	0.000	0.000	0.017	0.000	0.017	0.000	0.000
7440-43-9	48	Cd	0.000	0.000	0.000	0.022	0.000	0.021	0.000	0.000
7440-74-6	49	In	0.000	0.000	0.000	0.029	0.000	0.027	0.000	0.000
7440-31-5	50	Sn	0.000	0.000	0.000	0.035	0.000	0.033	0.000	0.000
7440-36-0	51	Sb	0.000	0.000	0.000	0.077	0.000	0.073	0.000	0.000
7440-39-3	56	Ba	0.000	0.000	0.000	0.143	0.000	0.136	0.000	0.000
7439-91-0	57	La	0.000	0.000	0.000	0.262	0.000	0.251	0.000	0.000
7439-97-6	80	Hg	0.001	0.001	0.005	0.003	0.002	0.007	0.002	0.000
7439-92-1	82	Pb	0.364	0.138	1.139	0.354	0.558	0.391	0.558	0.000

PM Profile Speciation Report - continued (profile 31202)

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
	201	OC	49.202	9.893	22.208	8.891	41.331	14.143	41.331	0.000
	202	EC	38.630	8.106	4.993	3.133	30.076	9.471	30.076	0.000
TOTALS:			97.951		33.666		80.727		80.727	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Light Duty Vehicles - Unleaded
Profile Number : 31203
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Vehicle exhaust gases sampled with a dilution sampler and constant volume sampling system. Analyzed using XRF and flame ionization.

SCC Assignments: 027, 028, 029, 030

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.890	0.930	0.970

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.154	0.131	0.129	0.071	0.158	0.144	0.158	0.000
7440-21-3	14	Si	6.237	3.971	1.555	0.804	4.618	3.815	4.618	0.000
7723-14-0	15	P	0.041	0.036	0.074	0.052	0.053	0.065	0.053	0.000
7704-34-9	16	S	5.393	2.732	0.694	0.554	4.346	2.658	4.346	0.000
7782-50-5	17	Cl	0.050	0.105	0.068	0.041	0.057	0.107	0.057	0.000
7440-09-7	19	K	0.024	0.045	0.018	0.012	0.022	0.045	0.022	0.000
7440-70-2	20	Ca	0.348	0.232	0.132	0.056	0.245	0.227	0.245	0.000
7440-32-6	22	Ti	0.005	0.017	0.007	0.027	0.006	0.031	0.006	0.000
7440-62-2	23	V	0.003	0.013	0.007	0.011	0.004	0.018	0.004	0.000
7440-47-3	24	Cr	0.000	0.013	0.017	0.008	0.006	0.018	0.006	0.000
7439-96-5	25	Mn	0.000	0.017	0.014	0.007	0.005	0.020	0.005	0.000
7439-89-6	26	Fe	0.000	0.037	0.057	0.024	0.017	0.046	0.017	0.000
7440-02-0	28	Ni	0.000	0.014	0.004	0.003	0.001	0.015	0.001	0.000
7440-50-8	29	Cu	0.006	0.016	0.003	0.004	0.005	0.016	0.005	0.000
7440-66-6	30	Zn	0.115	0.049	0.125	0.059	0.113	0.082	0.113	0.000
7440-55-3	31	Ga	0.007	0.013	0.001	0.002	0.004	0.012	0.004	0.000
7440-38-2	33	As	0.000	0.036	0.000	0.009	0.000	0.034	0.000	0.000
7782-49-2	34	Se	0.000	0.013	0.007	0.004	0.002	0.015	0.002	0.000
7726-95-6	35	Br	0.409	0.313	0.032	0.014	0.285	0.293	0.285	0.000
7440-17-7	37	Rb	0.000	0.021	0.000	0.005	0.000	0.020	0.000	0.000
7440-24-6	38	Sr	0.000	0.026	0.000	0.006	0.000	0.024	0.000	0.000
7440-65-5	39	Y	0.000	0.032	0.000	0.007	0.000	0.030	0.000	0.000
7440-67-7	40	Zr	0.000	0.143	0.000	0.034	0.000	0.135	0.000	0.000
7439-98-7	42	Mo	0.000	0.087	0.000	0.020	0.000	0.082	0.000	0.000
7440-05-3	46	Pd	0.000	0.089	0.000	0.021	0.000	0.084	0.000	0.000
7440-22-4	47	Ag	0.000	0.117	0.000	0.027	0.000	0.110	0.000	0.000
7440-43-9	48	Cd	0.000	0.153	0.000	0.036	0.000	0.144	0.000	0.000
7440-74-6	49	In	0.000	0.192	0.000	0.045	0.000	0.182	0.000	0.000
7440-31-5	50	Sn	0.000	0.233	0.000	0.054	0.000	0.220	0.000	0.000
7440-36-0	51	Sb	0.000	0.517	0.000	0.134	0.000	0.492	0.000	0.000
7440-39-3	56	Ba	0.000	0.968	0.000	0.225	0.000	0.914	0.000	0.000
7439-91-0	57	La	0.000	1.763	0.000	0.408	0.000	1.664	0.000	0.000
7439-97-6	80	Hg	0.000	0.016	0.004	0.005	0.002	0.017	0.002	0.000
7439-92-1	82	Pb	0.000	0.056	0.130	0.049	0.041	0.077	0.041	0.000

```
PM Profile Speciation Report  -  continued (profile 31203)
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                    Total
                             0-2.5 um       2.5-10 um       0-10 um       Measured(1)
              Species      ------------   ------------   ------------   ------------
 CAS Number  Num   Sym      %wt    unc     %wt    unc     %wt    unc     %wt    unc
--------------------------------------------------------------------------------
             201   OC     92.907 51.738  29.259 25.589  66.193 54.837  66.193  0.000
             202   EC      4.833  6.801   0.000  6.483   2.762  8.826   2.762  0.000
--------------------------------------------------------------------------------
TOTALS:                  110.532         32.337         78.945         78.945
================================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Light Duty Vehicles - Diesel
Profile Number : 32102
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Vehicle exhaust gases sampled with a dilution sampler and constant volume sampling system. Analyzed using XRF and flame ionization.

SCC Assignments: 111

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.920	0.960	1.000

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.007	0.004	0.224	0.101	0.023	0.109	0.023	0.000
7440-21-3	14	Si	0.202	0.177	0.444	0.106	0.217	0.207	0.217	0.000
7723-14-0	15	P	0.026	0.015	0.191	0.064	0.038	0.077	0.038	0.000
7704-34-9	16	S	0.589	0.168	1.002	0.270	0.617	0.337	0.617	0.000
7782-50-5	17	Cl	0.025	0.014	0.176	0.018	0.034	0.047	0.034	0.000
7440-09-7	19	K	0.005	0.002	0.037	0.016	0.007	0.024	0.007	0.000
7440-70-2	20	Ca	0.021	0.014	0.071	0.023	0.025	0.036	0.025	0.000
7440-32-6	22	Ti	0.000	0.000	0.014	0.023	0.001	0.025	0.001	0.000
7440-62-2	23	V	0.000	0.000	0.006	0.009	0.001	0.011	0.001	0.000
7440-47-3	24	Cr	0.000	0.000	0.015	0.007	0.001	0.013	0.001	0.000
7439-96-5	25	Mn	0.000	0.000	0.021	0.005	0.002	0.014	0.002	0.000
7439-89-6	26	Fe	0.016	0.006	0.381	0.130	0.035	0.142	0.035	0.000
7440-02-0	28	Ni	0.000	0.000	0.008	0.003	0.001	0.009	0.001	0.000
7440-50-8	29	Cu	0.001	0.000	0.008	0.002	0.002	0.009	0.002	0.000
7440-66-6	30	Zn	0.047	0.027	0.118	0.068	0.053	0.078	0.053	0.000
7440-55-3	31	Ga	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.000
7440-38-2	33	As	0.002	0.001	0.000	0.006	0.001	0.006	0.001	0.000
7782-49-2	34	Se	0.000	0.000	0.008	0.003	0.001	0.009	0.001	0.000
7726-95-6	35	Br	0.005	0.001	0.017	0.008	0.006	0.014	0.006	0.000
7440-17-7	37	Rb	0.000	0.000	0.000	0.003	0.000	0.003	0.000	0.000
7440-24-6	38	Sr	0.000	0.000	0.000	0.003	0.000	0.003	0.000	0.000
7440-65-5	39	Y	0.000	0.000	0.000	0.004	0.000	0.004	0.000	0.000
7440-67-7	40	Zr	0.000	0.002	0.000	0.018	0.000	0.017	0.000	0.000
7439-98-7	42	Mo	0.000	0.001	0.000	0.012	0.000	0.011	0.000	0.000
7440-05-3	46	Pd	0.000	0.001	0.000	0.011	0.000	0.011	0.000	0.000
7440-22-4	47	Ag	0.000	0.002	0.000	0.014	0.000	0.014	0.000	0.000
7440-43-9	48	Cd	0.000	0.002	0.000	0.019	0.000	0.018	0.000	0.000
7440-74-6	49	In	0.000	0.003	0.000	0.024	0.000	0.023	0.000	0.000
7440-31-5	50	Sn	0.000	0.003	0.000	0.029	0.000	0.028	0.000	0.000
7440-36-0	51	Sb	0.000	0.007	0.000	0.064	0.000	0.061	0.000	0.000
7440-39-3	56	Ba	0.000	0.013	0.000	0.121	0.000	0.116	0.000	0.000
7439-91-0	57	La	0.000	0.025	0.000	0.222	0.000	0.214	0.000	0.000
7439-97-6	80	Hg	0.000	0.000	0.002	0.002	0.000	0.005	0.000	0.000
7439-92-1	82	Pb	0.016	0.013	0.143	0.041	0.025	0.055	0.025	0.000

```
PM Profile Speciation Report  -  continued (profile 32102)
---------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                                 0-2.5 um       2.5-10 um       0-10 um      Measured(1)
                  Species      ------------   ------------   ------------   ------------
CAS Number   Num   Sym          %wt    unc     %wt    unc     %wt    unc     %wt    unc
---------------------------------------------------------------------------------
             201   OC         23.635  5.490  38.903  3.484  24.994  7.699  24.994  0.000
             202   EC         65.862 12.971  74.030  6.857  67.384 17.496  67.384  0.000
---------------------------------------------------------------------------------
TOTALS:                       90.459        115.819         93.468         93.468
=================================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Light Duty Vehicles - Diesel
Profile Number : 32103
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Vehicle exhaust gases sampled with a dilution sampler and constant volume sampling system. Analyzed using XRF and flame ionization.

SCC Assignments: 111

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.920	0.960	1.000

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.009	0.007	0.474	0.248	0.040	0.250	0.040	0.000
7440-21-3	14	Si	0.053	0.028	0.780	0.236	0.099	0.253	0.099	0.000
7723-14-0	15	P	0.026	0.008	0.229	0.122	0.040	0.127	0.040	0.000
7704-34-9	16	S	0.620	0.239	0.484	0.187	0.612	0.305	0.612	0.000
7782-50-5	17	Cl	0.035	0.012	0.427	0.166	0.060	0.175	0.060	0.000
7440-09-7	19	K	0.013	0.008	0.099	0.040	0.018	0.049	0.018	0.000
7440-70-2	20	Ca	0.023	0.014	0.103	0.037	0.028	0.049	0.028	0.000
7440-32-6	22	Ti	0.000	0.001	0.034	0.069	0.003	0.068	0.003	0.000
7440-62-2	23	V	0.000	0.001	0.015	0.028	0.001	0.029	0.001	0.000
7440-47-3	24	Cr	0.000	0.001	0.037	0.009	0.002	0.020	0.002	0.000
7439-96-5	25	Mn	0.000	0.001	0.051	0.019	0.003	0.028	0.003	0.000
7439-89-6	26	Fe	0.002	0.002	0.181	0.079	0.011	0.087	0.011	0.000
7440-02-0	28	Ni	0.000	0.001	0.016	0.008	0.001	0.014	0.001	0.000
7440-50-8	29	Cu	0.002	0.001	0.028	0.012	0.004	0.019	0.004	0.000
7440-66-6	30	Zn	0.037	0.011	0.061	0.019	0.039	0.031	0.039	0.000
7440-55-3	31	Ga	0.000	0.001	0.005	0.006	0.001	0.008	0.001	0.000
7440-38-2	33	As	0.002	0.002	0.000	0.019	0.002	0.019	0.002	0.000
7782-49-2	34	Se	0.000	0.001	0.026	0.008	0.002	0.017	0.002	0.000
7726-95-6	35	Br	0.002	0.001	0.059	0.019	0.005	0.029	0.005	0.000
7440-17-7	37	Rb	0.000	0.001	0.000	0.010	0.000	0.010	0.000	0.000
7440-24-6	38	Sr	0.000	0.001	0.000	0.013	0.000	0.013	0.000	0.000
7440-65-5	39	Y	0.000	0.002	0.000	0.016	0.000	0.015	0.000	0.000
7440-67-7	40	Zr	0.000	0.008	0.000	0.071	0.000	0.069	0.000	0.000
7439-98-7	42	Mo	0.000	0.005	0.000	0.045	0.000	0.044	0.000	0.000
7440-05-3	46	Pd	0.000	0.005	0.000	0.045	0.000	0.043	0.000	0.000
7440-22-4	47	Ag	0.000	0.006	0.000	0.058	0.000	0.056	0.000	0.000
7440-43-9	48	Cd	0.000	0.008	0.000	0.078	0.000	0.075	0.000	0.000
7440-74-6	49	In	0.000	0.010	0.000	0.097	0.000	0.093	0.000	0.000
7440-31-5	50	Sn	0.000	0.012	0.000	0.116	0.000	0.112	0.000	0.000
7440-36-0	51	Sb	0.000	0.027	0.000	0.260	0.000	0.250	0.000	0.000
7440-39-3	56	Ba	0.000	0.051	0.000	0.489	0.000	0.471	0.000	0.000
7439-91-0	57	La	0.000	0.094	0.000	0.906	0.000	0.873	0.000	0.000
7439-97-6	80	Hg	0.000	0.001	0.010	0.008	0.001	0.012	0.001	0.000
7439-92-1	82	Pb	0.025	0.017	0.311	0.092	0.042	0.107	0.042	0.000

PM Profile Speciation Report - continued (profile 32103)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um %wt	0-10 um unc	Total Measured(1) %wt	Total Measured(1) unc
	201	OC	43.358	2.103	102.175	36.083	47.468	36.367	47.468	0.000
	202	EC	62.746	7.051	26.851	8.747	60.160	13.617	60.160	0.000
TOTALS:			106.953		132.456		108.642		108.642	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Light Duty Vehicles - Diesel Composite
Profile Number : 32104
Data Quality : C

Control Device : Not Applicable
Reference(s) :
Data Source : Profile represents a composite of Profiles 32102 and 32103.

SCC Assignments: 111

Mass Fraction Data -				
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.920	0.960	1.000

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured	
CAS Number	Num	Sym	%wt	unc(1)	%wt	unc(1)	%wt	unc(1)	%wt	unc(1)
7429-90-5	13	Al	0.008	0.000	0.349	0.000	0.032	0.000	0.032	0.000
7440-21-3	14	Si	0.128	0.000	0.612	0.000	0.158	0.000	0.158	0.000
7723-14-0	15	P	0.026	0.000	0.210	0.000	0.039	0.000	0.039	0.000
7704-34-9	16	S	0.605	0.000	0.743	0.000	0.615	0.000	0.615	0.000
7782-50-5	17	Cl	0.030	0.000	0.302	0.000	0.047	0.000	0.047	0.000
7440-09-7	19	K	0.009	0.000	0.068	0.000	0.013	0.000	0.013	0.000
7440-70-2	20	Ca	0.022	0.000	0.087	0.000	0.027	0.000	0.027	0.000
7440-32-6	22	Ti	0.000	0.000	0.024	0.000	0.002	0.000	0.002	0.000
7440-62-2	23	V	0.000	0.000	0.011	0.000	0.006	0.000	0.006	0.000
7440-47-3	24	Cr	0.000	0.000	0.026	0.000	0.002	0.000	0.002	0.000
7439-96-5	25	Mn	0.000	0.000	0.036	0.000	0.003	0.000	0.003	0.000
7439-89-6	26	Fe	0.009	0.000	0.281	0.000	0.023	0.000	0.023	0.000
7440-02-0	28	Ni	0.000	0.000	0.012	0.000	0.001	0.000	0.001	0.000
7440-50-8	29	Cu	0.002	0.000	0.018	0.000	0.003	0.000	0.003	0.000
7440-66-6	30	Zn	0.042	0.000	0.090	0.000	0.046	0.000	0.046	0.000
7440-55-3	31	Ga	0.000	0.000	0.003	0.000	0.001	0.000	0.001	0.000
7440-38-2	33	As	0.002	0.000	0.000	0.000	0.002	0.000	0.002	0.000
7782-49-2	34	Se	0.000	0.000	0.017	0.000	0.002	0.000	0.002	0.000
7726-95-6	35	Br	0.004	0.000	0.038	0.000	0.006	0.000	0.006	0.000
7440-17-7	37	Rb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-24-6	38	Sr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-65-5	39	Y	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-67-7	40	Zr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-98-7	42	Mo	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-05-3	46	Pd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-22-4	47	Ag	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-74-6	49	In	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-31-5	50	Sn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-91-0	57	La	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-97-6	80	Hg	0.000	0.000	0.006	0.000	0.001	0.000	0.001	0.000
7439-92-1	82	Pb	0.021	0.000	0.227	0.000	0.034	0.000	0.034	0.000
	201	OC	33.497	0.000	70.539	0.000	36.231	0.000	36.231	0.000
	202	EC	64.304	0.000	50.441	0.000	63.772	0.000	63.772	0.000
TOTALS:			98.709		124.140		101.066		101.066	

(1) Uncertainty not evaluated.

PM Profile Speciation Report

Profile Name : Heavy Duty Vehicles - Diesel
Profile Number : 32203
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Vehicle exhaust gases sampled with a dilution sampler and constant volume sampling system. Analyzed using XRF and flame ionization.

SCC Assignments: 040, 041, 042, 043

Mass Fraction Data -				
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.920	0.960	1.000

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.003	0.026	1.909	1.598	0.137	1.548	0.137	0.000
7440-21-3	14	Si	0.018	0.018	1.417	1.253	0.110	1.214	0.110	0.000
7723-14-0	15	P	0.042	0.009	0.464	0.394	0.071	0.386	0.071	0.000
7704-34-9	16	S	0.343	0.055	0.650	0.782	0.347	0.759	0.347	0.000
7782-50-5	17	Cl	0.016	0.022	0.622	0.632	0.051	0.614	0.051	0.000
7440-09-7	19	K	0.000	0.010	0.251	0.217	0.018	0.214	0.018	0.000
7440-70-2	20	Ca	0.048	0.008	0.322	0.246	0.069	0.243	0.069	0.000
7440-32-6	22	Ti	0.002	0.004	0.061	0.630	0.009	0.605	0.009	0.000
7440-62-2	23	V	0.002	0.003	0.017	0.248	0.004	0.238	0.004	0.000
7440-47-3	24	Cr	0.000	0.003	0.152	0.129	0.011	0.130	0.011	0.000
7439-96-5	25	Mn	0.000	0.003	0.112	0.086	0.011	0.089	0.011	0.000
7439-89-6	26	Fe	0.000	0.008	0.274	0.282	0.015	0.276	0.015	0.000
7440-02-0	28	Ni	0.002	0.003	0.030	0.032	0.004	0.035	0.004	0.000
7440-50-8	29	Cu	0.001	0.003	0.059	0.065	0.004	0.067	0.004	0.000
7440-66-6	30	Zn	0.053	0.017	0.112	0.109	0.055	0.111	0.055	0.000
7440-55-3	31	Ga	0.000	0.002	0.000	0.017	0.000	0.016	0.000	0.000
7440-38-2	33	As	0.000	0.008	0.000	0.066	0.000	0.064	0.000	0.000
7782-49-2	34	Se	0.000	0.003	0.066	0.051	0.006	0.055	0.006	0.000
7726-95-6	35	Br	0.000	0.003	0.135	0.100	0.012	0.103	0.012	0.000
7440-17-7	37	Rb	0.000	0.004	0.000	0.037	0.000	0.035	0.000	0.000
7440-24-6	38	Sr	0.000	0.005	0.000	0.048	0.000	0.046	0.000	0.000
7440-65-5	39	Y	0.000	0.007	0.000	0.136	0.000	0.131	0.000	0.000
7440-67-7	40	Zr	0.000	0.030	0.000	0.254	0.000	0.245	0.000	0.000
7439-98-7	42	Mo	0.000	0.018	0.000	0.166	0.000	0.160	0.000	0.000
7440-05-3	46	Pd	0.000	0.018	0.000	0.157	0.000	0.151	0.000	0.000
7440-22-4	47	Ag	0.009	0.025	0.000	0.209	0.008	0.201	0.008	0.000
7440-43-9	48	Cd	0.000	0.032	0.000	0.278	0.000	0.269	0.000	0.000
7440-74-6	49	In	0.000	0.040	0.000	0.342	0.000	0.330	0.000	0.000
7440-31-5	50	Sn	0.000	0.048	0.000	0.416	0.000	0.401	0.000	0.000
7440-36-0	51	Sb	0.000	0.109	0.000	0.933	0.000	0.900	0.000	0.000
7440-39-3	56	Ba	0.000	0.202	0.000	1.760	0.000	1.698	0.000	0.000
7439-91-0	57	La	0.000	0.368	0.000	3.205	0.000	3.093	0.000	0.000
7439-97-6	80	Hg	0.000	0.003	0.023	0.033	0.002	0.035	0.002	0.000
7439-92-1	82	Pb	0.000	0.011	0.883	0.632	0.081	0.617	0.081	0.000

PM Profile Speciation Report - continued (profile 32203)

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
	201	OC	36.046	3.406	67.980	71.384	37.830	68.989	37.830	0.000
	202	EC	52.058	4.644	15.840	20.203	50.035	21.021	50.035	0.000
TOTALS:			88.643		91.379		88.890		88.890	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Heavy Duty Vehicles - Diesel
Profile Number : 32204
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Vehicle exhaust gases sampled with a dilution sampler and constant volume sampling system. Analyzed using XRF and flame ionization.

SCC Assignments: 040, 041, 042, 043

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.920	0.960	1.000

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.065	0.033	1.653	0.897	0.117	0.882	0.117	0.000
7440-21-3	14	Si	0.191	0.031	1.840	1.013	0.245	0.995	0.245	0.000
7723-14-0	15	P	0.059	0.009	0.467	0.329	0.071	0.325	0.071	0.000
7704-34-9	16	S	0.349	0.027	0.167	0.365	0.342	0.356	0.342	0.000
7782-50-5	17	Cl	0.022	0.009	0.585	0.429	0.039	0.421	0.039	0.000
7440-09-7	19	K	0.000	0.003	0.243	0.178	0.007	0.178	0.007	0.000
7440-70-2	20	Ca	[illegible]	0.006	0.307	0.155	0.042	0.160	0.042	0.000
7440-32-6	22	Ti	0.000	0.001	0.106	0.061	0.004	0.066	0.004	0.000
7440-62-2	23	V	0.000	0.001	0.060	0.039	0.002	0.044	0.002	0.000
7440-47-3	24	Cr	0.000	0.001	0.052	0.044	0.002	0.047	0.002	0.000
7439-96-5	25	Mn	0.000	0.001	0.094	0.051	0.003	0.057	0.003	0.000
7439-89-6	26	Fe	0.001	0.002	0.378	0.254	0.012	0.253	0.012	0.000
7440-02-0	28	Ni	0.000	0.001	0.026	0.023	0.001	0.027	0.001	0.000
7440-50-8	29	Cu	0.005	0.002	0.049	0.041	0.006	0.045	0.006	0.000
7440-66-6	30	Zn	0.045	0.002	0.151	0.088	0.048	0.093	0.048	0.000
7440-55-3	31	Ga	0.000	0.001	0.002	0.012	0.000	0.012	0.000	0.000
7440-38-2	33	As	0.000	0.002	0.000	0.053	0.000	0.051	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.060	0.038	0.002	0.043	0.002	0.000
7726-95-6	35	Br	0.000	0.001	0.146	0.093	0.005	0.097	0.005	0.000
7440-17-7	37	Rb	0.000	0.001	0.000	0.027	0.000	0.026	0.000	0.000
7440-24-6	38	Sr	0.000	0.002	0.000	0.032	0.000	0.031	0.000	0.000
7440-65-5	39	Y	0.000	0.002	0.000	0.041	0.000	0.039	0.000	0.000
7440-67-7	40	Zr	0.000	0.009	0.000	0.183	0.000	0.176	0.000	0.000
7439-98-7	42	Mo	0.000	0.006	0.000	0.119	0.000	0.114	0.000	0.000
7440-05-3	46	Pd	0.000	0.006	0.000	0.115	0.000	0.110	0.000	0.000
7440-22-4	47	Ag	0.000	0.007	0.000	0.152	0.000	0.146	0.000	0.000
7440-43-9	48	Cd	0.000	0.010	0.000	0.193	0.000	0.185	0.000	0.000
7440-74-6	49	In	0.000	0.012	0.000	0.256	0.000	0.246	0.000	0.000
7440-31-5	50	Sn	0.000	0.015	0.000	0.297	0.000	0.285	0.000	0.000
7440-36-0	51	Sb	0.000	0.032	0.000	0.659	0.000	0.633	0.000	0.000
7440-39-3	56	Ba	0.000	0.060	0.000	1.237	0.000	1.188	0.000	0.000
7439-91-0	57	La	0.000	0.111	0.000	2.313	0.000	2.221	0.000	0.000
7439-97-6	80	Hg	0.000	0.001	0.053	0.032	0.002	0.038	0.002	0.000
7439-92-1	82	Pb	0.000	0.004	0.861	0.474	0.028	0.469	0.028	0.000
TOTALS:			0.770		7.300		0.978		0.978	

(1) Estimated / extrapolated.

```
PM Profile Speciation Report
-----------------------------------------------------------------------------------
Profile Name   : Diesel Vehicles - Las Vegas Valley (1987)
Profile Number : 32205
Data Quality   : E
-----------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 20
Data Source    : Samples collected with two dichotomous samplers. Analyzed
                 using Sequential thermal oxidation and XRF.

SCC Assignments: 040, 041, 042, 043

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.920         0.960           1.000
-----------------------------------------------------------------------------------
Total Particulate Matter -
                                                                         Total
                                 0-2.5 um     2.5-10 um(1)   0-10 um(1)   Measured(1)
                   Species     ------------   ------------  ------------  ------------
 CAS Number  Num   Sym          %wt    unc     %wt    unc    %wt    unc    %wt    unc
-----------------------------------------------------------------------------------
  7429-90-5   13   Al          0.370  0.040   0.370  0.000  0.370  0.000  0.370  0.000
  7440-21-3   14   Si          1.030  0.100   1.030  0.000  1.030  0.000  1.030  0.000
  7704-34-9   16   S           0.620  0.060   0.620  0.000  0.620  0.000  0.620  0.000
  7782-50-5   17   Cl          0.000  0.000   0.000  0.000  0.000  0.000  0.000  0.000
  7440-09-7   19   K           0.160  0.030   0.160  0.000  0.160  0.000  0.160  0.000
  7439-92-1   82   Pb          0.210  0.020   0.210  0.000  0.210  0.000  0.210  0.000
             200   TC         44.000  4.400  44.000  0.000 44.000  0.000 44.000  0.000
-----------------------------------------------------------------------------------
TOTALS:                       46.390         46.390        46.390        46.390
===================================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Heavy Duty Vehicles - Diesel Composite
Profile Number : 32206
Data Quality :

Control Device : Not Applicable
Reference(s) :
Data Source : Profile represents a composite of Profiles 32203 and 32204.

SCC Assignments: 040, 041, 042, 043

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.920	0.960	1.000

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured	
CAS Number	Num	Sym	%wt	unc(1)	%wt	unc(1)	%wt	unc(1)	%wt	unc(1)
7429-90-5	13	Al	0.034	0.000	1.781	0.000	0.127	0.000	0.127	0.000
7440-21-3	14	Si	0.105	0.000	1.629	0.000	0.178	0.000	0.178	0.000
7723-14-0	15	P	0.051	0.000	0.466	0.000	0.071	0.000	0.071	0.000
7704-34-9	16	S	0.346	0.000	0.409	0.000	0.345	0.000	0.345	0.000
7782-50-5	17	Cl	0.019	0.000	0.604	0.000	0.045	0.000	0.045	0.000
7440-09-7	19	K	0.000	0.000	0.247	0.000	0.013	0.000	0.013	0.000
7440-70-2	20	Ca	0.041	0.000	0.315	0.000	0.056	0.000	0.056	0.000
7440-32-6	22	Ti	0.001	0.000	0.084	0.000	0.007	0.000	0.007	0.000
7440-62-2	23	V	0.001	0.000	0.039	0.000	0.003	0.000	0.003	0.000
7440-47-3	24	Cr	0.000	0.000	0.102	0.000	0.007	0.000	0.007	0.000
7439-96-5	25	Mn	0.000	0.000	0.103	0.000	0.007	0.000	0.007	0.000
7439-89-6	26	Fe	0.001	0.000	0.326	0.000	0.014	0.000	0.014	0.000
7440-02-0	28	Ni	0.001	0.000	0.028	0.000	0.003	0.000	0.003	0.000
7440-50-8	29	Cu	0.003	0.000	0.054	0.000	0.005	0.000	0.005	0.000
7440-66-6	30	Zn	0.049	0.000	0.132	0.000	0.052	0.000	0.052	0.000
7440-55-3	31	Ga	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
7440-38-2	33	As	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7782-49-2	34	Se	0.000	0.000	0.063	0.000	0.004	0.000	0.004	0.000
7726-95-6	35	Br	0.000	0.000	0.141	0.000	0.009	0.000	0.009	0.000
7440-17-7	37	Rb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-24-6	38	Sr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-65-5	39	Y	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-67-7	40	Zr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-98-7	42	Mo	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-05-3	46	Pd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-22-4	47	Ag	0.005	0.000	0.000	0.000	0.000	0.000	0.004	0.000
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-74-6	49	In	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-31-5	50	Sn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-91-0	57	La	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-97-6	80	Hg	0.000	0.000	0.038	0.000	0.002	0.000	0.002	0.000
7439-92-1	82	Pb	0.000	0.000	0.872	0.000	0.055	0.000	0.055	0.000
	201	OC	36.046	0.000	67.980	0.000	37.830	0.000	37.830	0.000
	202	EC	52.058	0.000	15.840	0.000	50.035	0.000	50.035	0.000
TOTALS:			88.761		91.254		88.868		88.872	

(1) Uncertainty not evaluated.

PM Profile Speciation Report

Profile Name : Transportation Composite
Profile Number : 33004
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Developed using steady state vehicle exhaust profiles and AP-42 tire wear factors, relative to vehicle miles traveled in the Sepulveda Tunnel (Los Angeles).

SCC Assignments: 110

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.690	0.770	0.820

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.076	0.039	0.179	0.123	0.092	0.123	0.095	0.043
7440-21-3	14	Si	0.645	0.924	0.219	0.166	0.577	0.797	0.451	0.585
7723-14-0	15	P	0.124	0.103	0.255	0.315	0.145	0.305	0.159	0.153
7704-34-9	16	S	1.364	0.926	1.796	1.875	1.432	1.904	1.459	0.956
7782-50-5	17	Cl	0.535	0.473	1.367	1.601	0.667	1.530	0.765	0.724
7440-09-7	19	K	0.005	0.006	0.017	0.017	0.007	0.019	0.007	0.004
7440-70-2	20	Ca	0.056	0.053	0.046	0.030	0.054	0.055	0.047	0.032
7440-32-6	22	Ti	0.006	0.004	0.021	0.017	0.008	0.019	0.010	0.006
7440-62-2	23	V	0.001	0.001	0.004	0.004	0.001	0.006	0.001	0.001
7440-47-3	24	Cr	0.000	0.001	0.005	0.004	0.001	0.007	0.001	0.001
7439-96-5	25	Mn	0.018	0.016	0.009	0.007	0.017	0.017	0.016	0.014
7439-89-6	26	Fe	0.001	0.003	0.027	0.025	0.005	0.026	0.007	0.004
7440-02-0	28	Ni	0.000	0.001	0.002	0.002	0.000	0.004	0.001	0.001
7440-50-8	29	Cu	0.003	0.002	0.004	0.004	0.003	0.006	0.003	0.002
7440-66-6	30	Zn	0.385	0.221	0.913	0.908	0.469	0.861	0.532	0.360
7440-55-3	31	Ga	0.001	0.002	0.000	0.001	0.001	0.002	0.001	0.001
7440-38-2	33	As	0.003	0.008	0.000	0.007	0.003	0.009	0.002	0.005
7782-49-2	34	Se	0.000	0.001	0.004	0.004	0.001	0.006	0.001	0.001
7726-95-6	35	Br	0.174	0.106	0.022	0.017	0.150	0.094	0.122	0.080
7440-17-7	37	Rb	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.001
7440-24-6	38	Sr	0.003	0.004	0.009	0.012	0.004	0.014	0.005	0.005
7440-65-5	39	Y	0.000	0.003	0.000	0.003	0.000	0.004	0.000	0.002
7440-67-7	40	Zr	0.000	0.013	0.000	0.011	0.000	0.015	0.000	0.007
7439-98-7	42	Mo	0.000	0.008	0.000	0.007	0.000	0.009	0.000	0.004
7440-05-3	46	Pd	0.000	0.008	0.000	0.007	0.000	0.009	0.000	0.004
7440-22-4	47	Ag	0.000	0.010	0.000	0.009	0.000	0.012	0.000	0.005
7440-43-9	48	Cd	0.000	0.013	0.000	0.011	0.000	0.015	0.000	0.007
7440-74-6	49	In	0.000	0.017	0.000	0.015	0.000	0.020	0.000	0.009
7440-31-5	50	Sn	0.000	0.020	0.000	0.017	0.000	0.023	0.000	0.011
7440-36-0	51	Sb	0.000	0.045	0.000	0.038	0.000	0.051	0.000	0.024
7440-39-3	56	Ba	0.001	0.085	0.002	0.072	0.001	0.097	0.001	0.045
7439-91-0	57	La	0.000	0.155	0.000	0.134	0.000	0.179	0.000	0.082
7439-97-6	80	Hg	0.000	0.001	0.004	0.004	0.001	0.006	0.001	0.001
7439-92-1	82	Pb	0.245	0.149	0.088	0.065	0.220	0.144	0.195	0.128

PM Profile Speciation Report - continued (profile 33004)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um(1) %wt	0-10 um(1) unc	Total Measured %wt	Total Measured unc
	201	OC	52.728	21.578	60.260	53.967	53.922	53.346	54.147	25.247
	202	EC	45.404	16.481	27.351	27.084	42.542	29.056	39.907	17.021
TOTALS:			101.778		92.604		100.323		97.936	

(1) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Transportation Composite
Profile Number : 33005
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Developed using steady state vehicle exhaust profiles and no tire wear factors included, relative to vehicle miles traveled in the Sepulveda Tunnel (Los Angeles).

SCC Assignments: 110

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
Size Interval (um) :		(0-2.5)	(0-6)	(0-10)
Mass Fraction :		0.690	0.770	0.820

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.077	0.051	0.959	0.636	0.217	0.595	0.116	0.054
7440-21-3	14	Si	0.957	1.391	1.484	1.075	1.041	1.543	0.843	1.122
7723-14-0	15	P	0.057	0.020	0.288	0.211	0.094	0.200	0.069	0.024
7704-34-9	16	S	1.037	1.182	0.360	0.440	0.930	1.082	0.940	1.058
7782-50-5	17	Cl	0.029	0.020	0.374	0.272	0.084	0.256	0.046	0.022
7440-09-7	19	K	0.008	0.008	0.140	0.110	0.029	0.106	0.014	0.008
7440-70-2	20	Ca	0.072	0.079	0.213	0.132	0.094	0.144	0.069	0.058
7440-32-6	22	Ti	0.001	0.003	0.059	0.044	0.010	0.045	0.004	0.003
7440-62-2	23	V	0.001	0.002	0.034	0.026	0.006	0.028	0.002	0.002
7440-47-3	24	Cr	0.000	0.002	0.038	0.028	0.006	0.030	0.002	0.002
7439-96-5	25	Mn	0.028	0.024	0.078	0.041	0.036	0.048	0.031	0.024
7439-89-6	26	Fe	0.001	0.005	0.233	0.165	0.038	0.157	0.013	0.006
7440-02-0	28	Ni	0.000	0.002	0.017	0.014	0.003	0.016	0.001	0.001
7440-50-8	29	Cu	0.005	0.003	0.030	0.024	0.009	0.026	0.006	0.003
7440-66-6	30	Zn	0.053	0.028	0.125	0.088	0.064	0.089	0.056	0.030
7440-55-3	31	Ga	0.002	0.002	0.002	0.007	0.002	0.007	0.001	0.002
7440-38-2	33	As	0.004	0.012	0.000	0.061	0.003	0.057	0.004	0.011
7782-49-2	34	Se	0.000	0.002	0.036	0.025	0.006	0.027	0.002	0.001
7726-95-6	35	Br	0.264	0.152	0.184	0.120	0.251	0.175	0.242	0.134
7440-17-7	37	Rb	0.000	0.003	0.000	0.014	0.000	0.013	0.000	0.002
7440-24-6	38	Sr	0.000	0.003	0.000	0.016	0.000	0.015	0.000	0.002
7440-65-5	39	Y	0.000	0.004	0.000	0.020	0.000	0.019	0.000	0.003
7440-67-7	40	Zr	0.000	0.019	0.000	0.090	0.000	0.084	0.000	0.013
7439-98-7	42	Mo	0.000	0.012	0.000	0.058	0.000	0.054	0.000	0.008
7440-05-3	46	Pd	0.000	0.012	0.000	0.057	0.000	0.053	0.000	0.008
7440-22-4	47	Ag	0.000	0.016	0.000	0.075	0.000	0.070	0.000	0.011
7440-43-9	48	Cd	0.000	0.020	0.000	0.095	0.000	0.089	0.000	0.014
7440-74-6	49	In	0.000	0.026	0.000	0.126	0.000	0.118	0.000	0.018
7440-31-5	50	Sn	0.000	0.031	0.000	0.146	0.000	0.136	0.000	0.021
7440-36-0	51	Sb	0.000	0.069	0.000	0.325	0.000	0.304	0.000	0.048
7440-39-3	56	Ba	0.000	0.129	0.000	0.609	0.000	0.569	0.000	0.089
7439-91-0	57	La	0.000	0.236	0.000	1.138	0.000	1.063	0.000	0.162
7439-97-6	80	Hg	0.000	0.002	0.030	0.022	0.005	0.024	0.002	0.002
7439-92-1	82	Pb	0.373	0.207	0.749	0.425	0.433	0.439	0.385	0.206

```
PM Profile Speciation Report  -  continued (profile 33005)
-------------------------------------------------------------------------------
Total Particulate Matter -
                                                                       Total
                            0-2.5 um       2.5-10 um      0-10 um(1)      Measured
                Species   ------------   ------------   ------------   ------------
 CAS Number   Num   Sym      %wt    unc     %wt    unc     %wt    unc     %wt    unc
-------------------------------------------------------------------------------
              201   OC    49.809 24.151  74.890 39.591  53.785 42.511  50.081 20.949
              202   EC    54.153 19.783  17.275  9.531  48.306 19.932  50.878 18.906
-------------------------------------------------------------------------------
TOTALS:                  106.931         97.598         105.452         103.807
===============================================================================
(1)  Calculated based on methodology described in the Air Emissions Species Manual,
     Volume II.
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PM Profile Speciation Report

Profile Name : Transportation Composite
Profile Number : 33006
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Developed using Federal test procedure vehicle emission profiles and California Air Resources Board emission factors. Tire wear factors are not included.

SCC Assignments: 110

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.690	0.770	0.820

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.332	0.216	0.712	0.513	0.392	0.514	0.430	0.229
7440-21-3	14	Si	0.908	0.407	0.554	0.239	0.852	0.427	0.855	0.346
7723-14-0	15	P	0.155	0.069	0.207	0.101	0.163	0.117	0.163	0.054
7704-34-9	16	S	0.799	0.562	0.214	1.388	0.706	1.362	0.714	0.539
7782-50-5	17	Cl	0.102	0.085	0.096	0.230	0.101	0.224	0.122	0.091
7440-09-7	19	K	0.018	0.010	0.049	0.033	0.023	0.036	0.028	0.010
7440-70-2	20	Ca	0.150	0.040	0.329	0.126	0.178	0.132	0.160	0.040
7440-32-6	22	Ti	0.003	0.002	0.023	0.081	0.006	0.075	0.007	0.014
7440-62-2	23	V	0.005	0.003	0.006	0.032	0.005	0.030	0.005	0.006
7440-47-3	24	Cr	0.001	0.002	0.048	0.020	0.008	0.025	0.009	0.002
7439-96-5	25	Mn	0.306	0.207	0.796	0.309	0.384	0.348	0.353	0.216
7439-89-6	26	Fe	0.115	0.036	0.842	0.251	0.230	0.253	0.192	0.051
7440-02-0	28	Ni	0.004	0.002	0.025	0.008	0.007	0.014	0.008	0.003
7440-50-8	29	Cu	0.014	0.006	0.038	0.013	0.018	0.020	0.017	0.005
7440-66-6	30	Zn	0.184	0.062	0.373	0.107	0.214	0.126	0.188	0.052
7440-55-3	31	Ga	0.010	0.013	0.004	0.048	0.009	0.046	0.009	0.013
7440-38-2	33	As	0.003	0.216	0.000	0.807	0.003	0.762	0.003	0.210
7782-49-2	34	Se	0.000	0.002	0.014	0.010	0.002	0.013	0.004	0.002
7726-95-6	35	Br	1.958	0.839	3.970	1.870	2.277	1.905	2.219	0.983
7440-17-7	37	Rb	0.002	0.014	0.000	0.056	0.002	0.053	0.002	0.015
7440-24-6	38	Sr	0.000	0.003	0.000	0.008	0.000	0.008	0.000	0.003
7440-65-5	39	Y	0.000	0.013	0.000	0.056	0.000	0.053	0.000	0.013
7440-67-7	40	Zr	0.000	0.015	0.000	0.037	0.000	0.036	0.000	0.017
7439-98-7	42	Mo	0.000	0.009	0.000	0.022	0.000	0.022	0.000	0.010
7440-05-3	46	Pd	0.000	0.009	0.000	0.025	0.000	0.024	0.000	0.010
7440-22-4	47	Ag	0.004	0.012	0.000	0.028	0.003	0.028	0.003	0.013
7440-43-9	48	Cd	0.000	0.016	0.000	0.046	0.000	0.044	0.000	0.019
7440-74-6	49	In	0.000	0.020	0.000	0.046	0.000	0.045	0.000	0.022
7440-31-5	50	Sn	0.000	0.024	0.000	0.059	0.000	0.058	0.000	0.027
7440-36-0	51	Sb	0.000	0.053	0.000	0.125	0.000	0.123	0.000	0.060
7440-39-3	56	Ba	0.000	0.099	0.000	0.235	0.000	0.231	0.000	0.111
7439-91-0	57	La	0.000	0.180	0.000	0.428	0.000	0.421	0.000	0.203
7439-97-6	80	Hg	0.001	0.002	0.013	0.007	0.003	0.011	0.002	0.002
7439-92-1	82	Pb	6.760	2.998	19.942	7.523	8.850	7.587	8.495	3.765

PM Profile Speciation Report - continued (profile 33006)

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
	201	OC	36.474	8.684	16.456	9.962	33.300	12.560	34.722	9.320
	202	EC	38.767	7.216	8.743	4.710	34.007	8.798	33.449	6.554
TOTALS:			87.075		53.454		81.743		82.159	

(1) Calculated based on methodology described in the Air Emission Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Transportation Composite
Profile Number : 33007
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Developed using Federal test procedure vehicle emission profiles with no tire wear factors included.

SCC Assignments: 110

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.690	0.770	0.820

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.032	0.045	1.431	1.945	0.254	1.791	0.155	0.161
7440-21-3	14	Si	0.093	0.067	1.090	1.467	0.251	1.352	0.175	0.142
7723-14-0	15	P	0.049	0.050	0.367	0.475	0.099	0.441	0.075	0.080
7704-34-9	16	S	0.379	0.400	0.536	0.894	0.404	0.891	0.381	0.400
7782-50-5	17	Cl	0.026	0.030	0.442	0.681	0.092	0.628	0.058	0.068
7440-09-7	19	K	0.002	0.009	0.179	0.257	0.030	0.239	0.018	0.022
7440-70-2	20	Ca	0.051	0.055	0.301	0.329	0.091	0.309	0.071	0.078
7440-32-6	22	Ti	0.002	0.004	0.047	0.435	0.009	0.399	0.008	0.032
7440-62-2	23	V	0.002	0.003	0.013	0.171	0.004	0.157	0.003	0.013
7440-47-3	24	Cr	0.000	0.003	0.113	0.155	0.018	0.145	0.010	0.012
7439-96-5	25	Mn	0.035	0.052	0.333	0.342	0.082	0.321	0.054	0.066
7439-89-6	26	Fe	0.009	0.010	0.429	0.380	0.076	0.354	0.031	0.026
7440-02-0	28	Ni	0.002	0.003	0.027	0.034	0.006	0.034	0.004	0.005
7440-50-8	29	Cu	0.002	0.003	0.050	0.068	0.010	0.065	0.005	0.006
7440-66-6	30	Zn	0.060	0.062	0.182	0.160	0.079	0.160	0.066	0.066
7440-55-3	31	Ga	0.001	0.003	0.001	0.019	0.001	0.018	0.001	0.003
7440-38-2	33	As	0.000	0.026	0.000	0.269	0.000	0.248	0.001	0.028
7782-49-2	34	Se	0.000	0.002	0.047	0.065	0.007	0.062	0.005	0.007
7726-95-6	35	Br	0.224	0.305	1.390	1.689	0.409	1.578	0.293	0.386
7440-17-7	37	Rb	0.000	0.004	0.000	0.031	0.000	0.029	0.000	0.005
7440-24-6	38	Sr	0.000	0.005	0.000	0.033	0.000	0.031	0.000	0.005
7440-65-5	39	Y	0.000	0.006	0.000	0.095	0.000	0.087	0.000	0.009
7440-67-7	40	Zr	0.000	0.025	0.000	0.174	0.000	0.161	0.000	0.029
7439-98-7	42	Mo	0.000	0.016	0.000	0.114	0.000	0.105	0.000	0.019
7440-05-3	46	Pd	0.000	0.016	0.000	0.107	0.000	0.099	0.000	0.018
7440-22-4	47	Ag	0.008	0.024	0.000	0.143	0.007	0.133	0.007	0.026
7440-43-9	48	Cd	0.000	0.028	0.000	0.191	0.000	0.177	0.000	0.032
7440-74-6	49	In	0.000	0.035	0.000	0.235	0.000	0.218	0.000	0.040
7440-31-5	50	Sn	0.000	0.042	0.000	0.285	0.000	0.264	0.000	0.048
7440-36-0	51	Sb	0.000	0.094	0.000	0.640	0.000	0.592	0.000	0.108
7440-39-3	56	Ba	0.000	0.174	0.000	1.208	0.000	1.118	0.000	0.200
7439-91-0	57	La	0.000	0.317	0.000	2.200	0.000	2.036	0.000	0.367
7439-97-6	80	Hg	0.000	0.003	0.019	0.030	0.003	0.030	0.002	0.004
7439-92-1	82	Pb	0.779	1.069	7.092	8.239	1.780	7.638	1.154	1.484
	201	OC	34.831	40.857	50.978	75.139	37.391	77.257	36.262	42.168

PM Profile Speciation Report - continued (profile 33007)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um(1) %wt	0-10 um(1) unc	Total Measured %wt	Total Measured unc
	202	EC	51.911	59.353	18.052	20.450	46.543	53.729	49.703	56.151
TOTALS:			88.498		83.119		87.646		88.542	

(1) Calculated based on methodology described in the Air Emission Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Transportation Composite
Profile Number : 33008
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Developed using Federal test procedure vehicle emission profiles, AP-42 tire wear factors, and asbestos brake wear data.

SCC Assignments: 110

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.690	0.770	0.820

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.035	0.043	0.949	1.165	0.180	1.075	0.152	0.147
7440-21-3	14	Si	0.192	0.114	1.927	1.217	0.467	1.137	0.370	0.225
7723-14-0	15	P	0.053	0.048	0.296	0.295	0.092	0.278	0.082	0.075
7704-34-9	16	S	0.417	0.384	0.844	0.669	0.485	0.702	0.448	0.375
7782-50-5	17	Cl	0.065	0.053	0.677	0.547	0.162	0.511	0.127	0.100
7440-09-7	19	K	0.002	0.008	0.113	0.154	0.020	0.144	0.017	0.020
7440-70-2	20	Ca	0.068	0.057	0.411	0.309	0.122	0.294	0.103	0.084
7440-32-6	22	Ti	0.002	0.004	0.034	0.275	0.007	0.253	0.009	0.030
7440-62-2	23	V	0.002	0.003	0.008	0.108	0.003	0.099	0.003	0.012
7440-47-3	24	Cr	0.001	0.003	0.083	0.093	0.014	0.088	0.011	0.011
7439-96-5	25	Mn	0.035	0.050	0.216	0.201	0.064	0.193	0.052	0.060
7439-89-6	26	Fe	0.046	0.037	0.725	0.394	0.154	0.374	0.105	0.074
7440-02-0	28	Ni	0.002	0.003	0.017	0.020	0.004	0.021	0.004	0.005
7440-50-8	29	Cu	0.002	0.003	0.032	0.041	0.007	0.040	0.005	0.005
7440-66-6	30	Zn	0.087	0.064	0.409	0.200	0.138	0.201	0.114	0.074
7440-55-3	31	Ga	0.001	0.003	0.001	0.012	0.001	0.012	0.001	0.003
7440-38-2	33	As	0.000	0.025	0.000	0.170	0.000	0.157	0.001	0.026
7782-49-2	34	Se	0.000	0.002	0.030	0.039	0.005	0.038	0.005	0.007
7726-95-6	35	Br	0.216	0.290	0.880	0.994	0.321	0.950	0.274	0.352
7440-17-7	37	Rb	0.000	0.004	0.000	0.020	0.000	0.019	0.000	0.004
7440-24-6	38	Sr	0.001	0.004	0.007	0.021	0.002	0.021	0.001	0.005
7440-65-5	39	Y	0.000	0.006	0.000	0.060	0.000	0.055	0.000	0.008
7440-67-7	40	Zr	0.000	0.025	0.000	0.110	0.000	0.103	0.000	0.028
7439-98-7	42	Mo	0.000	0.015	0.000	0.072	0.000	0.067	0.000	0.018
7440-05-3	46	Pd	0.000	0.015	0.000	0.068	0.000	0.064	0.000	0.017
7440-22-4	47	Ag	0.008	0.023	0.000	0.091	0.007	0.086	0.006	0.024
7440-43-9	48	Cd	0.000	0.027	0.000	0.121	0.000	0.113	0.000	0.030
7440-74-6	49	In	0.000	0.033	0.000	0.149	0.000	0.139	0.000	0.037
7440-31-5	50	Sn	0.000	0.040	0.000	0.180	0.000	0.169	0.000	0.045
7440-36-0	51	Sb	0.000	0.090	0.000	0.405	0.000	0.379	0.000	0.101
7440-39-3	56	Ba	0.009	0.168	0.105	0.769	0.024	0.720	0.017	0.188
7439-91-0	57	La	0.000	0.306	0.000	1.392	0.000	1.303	0.000	0.343
7439-97-6	80	Hg	0.000	0.003	0.012	0.018	0.002	0.019	0.002	0.004
7439-92-1	82	Pb	0.752	1.018	4.488	4.831	1.344	4.533	1.078	1.354

PM Profile Speciation Report - continued (profile 33008)

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
	201	OC	35.106	38.883	47.056	46.624	37.001	54.158	36.601	38.463
	202	EC	50.831	56.450	18.707	13.564	45.738	49.500	47.788	51.121
TOTALS:			87.933		78.027		86.364		87.376	

(1) Calculated based on methodology described in the Air Emission Species Manual, Volume II.

PM Profile Speciation Report

Profile Name : Transportation Composite
Profile Number : 33009
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Samples collected through a vent eight feet above roadway in Sepulveda Tunnel (Los Angeles) using Sierra Model 244 manual dichotomous samplers. Analyzed using XRF and flame ionization.

SCC Assignments: 110

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.690	0.770	0.820

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um(1)		Total Measured(2)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.338	0.131	0.816	2.154	0.414	1.982	0.338	0.131
7440-21-3	14	Si	0.383	0.225	6.053	14.086	1.282	12.934	0.383	0.225
7723-14-0	15	P	0.293	0.054	0.241	0.522	0.285	0.484	0.293	0.054
7704-34-9	16	S	0.731	0.304	0.092	1.643	0.630	1.531	0.731	0.304
7782-50-5	17	Cl	0.363	0.324	0.000	20.748	0.306	19.035	0.363	0.324
7440-09-7	19	K	0.019	0.021	0.000	0.784	0.016	0.720	0.019	0.021
7440-70-2	20	Ca	0.125	0.048	1.327	2.719	0.316	2.498	0.125	0.048
7440-32-6	22	Ti	0.004	0.011	0.008	0.132	0.005	0.122	0.004	0.011
7440-62-2	23	V	0.000	0.004	0.000	0.069	0.000	0.063	0.000	0.004
7440-47-3	24	Cr	0.004	0.004	0.018	0.047	0.007	0.045	0.004	0.004
7439-96-5	25	Mn	0.134	0.017	0.201	0.426	0.145	0.393	0.134	0.017
7439-89-6	26	Fe	2.218	0.277	11.338	23.081	3.664	21.198	2.218	0.277
7440-02-0	28	Ni	0.010	0.003	0.056	0.111	0.017	0.103	0.010	0.003
7440-50-8	29	Cu	0.112	0.014	0.291	0.611	0.140	0.563	0.112	0.014
7440-66-6	30	Zn	0.247	0.031	0.606	1.150	0.304	1.058	0.247	0.031
7440-55-3	31	Ga	0.003	0.005	0.003	0.012	0.003	0.012	0.003	0.005
7440-38-2	33	As	0.039	0.082	0.000	0.108	0.033	0.121	0.039	0.082
7782-49-2	34	Se	0.000	0.002	0.002	0.007	0.000	0.008	0.000	0.002
7726-95-6	35	Br	1.355	0.164	0.269	0.634	1.183	0.620	1.355	0.164
7440-17-7	37	Rb	0.000	0.011	0.018	0.050	0.003	0.048	0.000	0.011
7440-24-6	38	Sr	0.000	0.005	0.000	0.480	0.000	0.441	0.000	0.005
7440-65-5	39	Y	0.000	0.008	0.000	0.015	0.000	0.015	0.000	0.008
7440-67-7	40	Zr	0.000	0.026	0.000	0.065	0.000	0.064	0.000	0.026
7439-98-7	42	Mo	0.020	0.018	0.039	0.062	0.023	0.061	0.020	0.018
7440-05-3	46	Pd	0.000	0.016	0.000	0.037	0.000	0.036	0.000	0.016
7440-22-4	47	Ag	0.000	0.021	0.000	0.048	0.000	0.047	0.000	0.021
7440-43-9	48	Cd	0.000	0.028	0.000	0.064	0.000	0.063	0.000	0.028
7440-74-6	49	In	0.000	0.035	0.000	0.080	0.000	0.079	0.000	0.035
7440-31-5	50	Sn	0.000	0.042	0.000	0.096	0.000	0.095	0.000	0.042
7440-36-0	51	Sb	0.000	0.092	0.000	0.216	0.000	0.212	0.000	0.092
7440-39-3	56	Ba	0.328	0.056	1.077	1.905	0.447	1.753	0.328	0.056
7439-91-0	57	La	0.000	0.318	0.000	0.722	0.000	0.714	0.000	0.318
7439-97-6	80	Hg	0.000	0.003	0.002	0.007	0.000	0.008	0.000	0.003

PM Profile Speciation Report - continued (profile 33009)

Total Particulate Matter -

CAS Number	Species Num	Species Sym	0-2.5 um %wt	0-2.5 um unc	2.5-10 um %wt	2.5-10 um unc	0-10 um(1) %wt	0-10 um(1) unc	Total Measured(2) %wt	Total Measured(2) unc
7439-92-1	82	Pb	2.437	0.298	2.049	3.952	2.375	3.651	2.437	0.298
	201	OC	38.586	5.550	39.164	61.704	38.677	57.077	38.586	5.550
	202	EC	38.119	4.909	12.656	24.275	34.082	23.124	38.119	4.909
TOTALS:			85.868		76.326		84.357		85.868	

(1) Calculated based on methodology described in the Air Emissions Species Manual, Volume II.

(2) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Gasoline Vehicles - Las Vegas Valley (1987)
Profile Number : 33010
Data Quality : E

Control Device : Not Applicable
Reference(s) : 20
Data Source : Samples collected with two dichotomous samplers. Analyzed using Sequential thermal oxidation and XRF.

SCC Assignments: 110

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.670	0.750	0.800

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um(1)		0-10 um(1)		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	0.046	0.005	0.046	0.000	0.046	0.000	0.046	0.000
7440-21-3	14	Si	0.092	0.009	0.092	0.000	0.092	0.000	0.092	0.000
7704-34-9	16	S	0.092	0.009	0.092	0.000	0.092	0.000	0.092	0.000
7782-50-5	17	Cl	0.830	0.083	0.830	0.000	0.830	0.000	0.830	0.000
7440-09-7	19	K	0.320	0.032	0.320	0.000	0.320	0.000	0.320	0.000
7439-92-1	82	Pb	2.500	0.250	2.500	0.000	2.500	0.000	2.500	0.000
	200	TC	57.600	10.000	57.600	0.000	57.600	0.000	57.600	0.000
TOTALS:			61.480		61.480		61.480		61.480	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Highway Vehicles Composite
Profile Number : 33011
Data Quality : C

Control Device : Not Applicable
Reference(s) :
Data Source : Profile represents a composite of Profiles 33004, 33005, 33006, 33007, 33008, and 33009.

SCC Assignments: 110

Mass Fraction Data -	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.690	0.770	0.820

Total Particulate Matter -

CAS Number	Species Num	Sym	0-2.5 um %wt	0-2.5 um unc(1)	2.5-10 um %wt	2.5-10 um unc(1)	0-10 um %wt	0-10 um unc(1)	Total Measured %wt	Total Measured unc(1)
7429-90-5	13	Al	0.148	0.000	0.841	0.000	0.258	0.000	0.214	0.000
7440-21-3	14	Si	0.530	0.000	1.888	0.000	0.745	0.000	0.513	0.000
7723-14-0	15	P	0.122	0.000	0.276	0.000	0.146	0.000	0.140	0.000
7704-34-9	16	S	0.789	0.000	0.507	0.000	0.765	0.000	0.779	0.000
7782-50-5	17	Cl	0.187	0.000	0.493	0.000	0.235	0.000	0.247	0.000
7440-09-7	19	K	0.009	0.000	0.083	0.000	0.021	0.000	0.017	0.000
7440-70-2	20	Ca	0.087	0.000	0.438	0.000	0.143	0.000	0.096	0.000
7440-32-6	22	Ti	0.003	0.000	0.032	0.000	0.008	0.000	0.007	0.000
7440-62-2	23	V	0.002	0.000	0.011	0.000	0.003	0.000	0.002	0.000
7440-47-3	24	Cr	0.001	0.000	0.051	0.000	0.009	0.000	0.006	0.000
7439-96-5	25	Mn	0.093	0.000	0.272	0.000	0.121	0.000	0.107	0.000
7439-89-6	26	Fe	0.398	0.000	0.266	0.000	0.695	0.000	0.428	0.000
7440-02-0	28	Ni	0.003	0.000	0.024	0.000	0.006	0.000	0.005	0.000
7440-50-8	29	Cu	0.023	0.000	0.074	0.000	0.031	0.000	0.025	0.000
7440-66-6	30	Zn	0.169	0.000	0.435	0.000	0.211	0.000	0.201	0.000
7440-55-3	31	Ga	0.003	0.000	0.002	0.000	0.003	0.000	0.003	0.000
7440-38-2	33	As	0.008	0.000	0.000	0.000	0.007	0.000	0.008	0.000
7782-49-2	34	Se	0.000	0.000	0.022	0.000	0.004	0.000	0.003	0.000
7726-95-6	35	Br	0.700	0.000	1.119	0.000	0.765	0.000	0.751	0.000
7440-17-7	37	Rb	0.000	0.000	0.003	0.000	0.008	0.000	0.001	0.000
7440-24-6	38	Sr	0.001	0.000	0.003	0.000	0.001	0.000	0.001	0.000
7440-65-5	39	Y	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-67-7	40	Zr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-98-7	42	Mo	0.003	0.000	0.007	0.000	0.004	0.000	0.003	0.000
7440-05-3	46	Pd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-22-4	47	Ag	0.003	0.000	0.000	0.000	0.003	0.000	0.003	0.000
7440-43-9	48	Cd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-74-6	49	In	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-31-5	50	Sn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	0.056	0.000	0.197	0.000	0.079	0.000	0.058	0.000
7439-91-0	57	La	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-97-6	80	Hg	0.002	0.000	0.013	0.000	0.002	0.000	0.002	0.000
7439-92-1	82	Pb	1.891	0.000	5.721	0.000	2.500	0.000	2.291	0.000
	201	OC	41.256	0.000	48.134	0.000	42.346	0.000	41.733	0.000

PM Profile Speciation Report - continued (profile 33011)

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured	
CAS Number	Num	Sym	%wt	unc(1)	%wt	unc(1)	%wt	unc(1)	%wt	unc(1)
	202	EC	46.531	0.000	17.131	0.000	41.870	0.000	43.307	0.000
TOTALS:			93.018		78.043		90.989		90.951	

(1) Uncertainty not evaluated.

PM Profile Speciation Report

Profile Name : Tire Wear
Profile Number : 34003
Data Quality : E

Control Device : Not Applicable
Reference(s) : 1,21,22
Data Source : Data taken from Reference 1. For details, consult References 21 and 22.

SCC Assignments: 112

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.390	0.480	0.550

Total Particulate Matter -

	Species		0-2.5 um(1)		2.5-10 um(1)		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.054	0.000	0.054	0.000	0.054	0.000	0.054	0.013
7439-95-4	12	Mg	0.039	0.000	0.039	0.000	0.039	0.000	0.039	0.008
7429-90-5	13	Al	0.074	0.000	0.074	0.000	0.074	0.000	0.074	0.022
7440-21-3	14	Si	0.050	0.000	0.050	0.000	0.050	0.000	0.050	0.050
7723-14-0	15	P	0.250	0.000	0.250	0.000	0.250	0.000	0.250	0.250
7704-34-9	16	S	1.989	0.000	1.989	0.000	1.989	0.000	1.989	0.694
7782-50-5	17	Cl	1.500	0.000	1.500	0.000	1.500	0.000	1.500	1.000
7440-70-2	20	Ca	0.024	0.000	0.024	0.000	0.024	0.000	0.024	0.008
7440-32-6	22	Ti	0.016	0.000	0.016	0.000	0.016	0.000	0.016	0.005
7440-62-2	23	V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7439-96-5	25	Mn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-50-8	29	Cu	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-66-6	30	Zn	1.018	0.000	1.018	0.000	1.018	0.000	1.018	0.047
7726-95-6	35	Br	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-24-6	38	Sr	0.010	0.000	0.010	0.000	0.010	0.000	0.010	0.008
7440-39-3	56	Ba	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.002
7439-91-0	57	La	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	201	OC	58.300	0.000	58.300	0.000	58.300	0.000	58.300	15.000
	202	EC	28.700	0.000	28.700	0.000	28.700	0.000	28.700	10.000
TOTALS:			92.027		92.027		92.027		92.027	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Brake Lining, Asbestos
Profile Number : 34004
Data Quality : E

Control Device : Not Applicable
Reference(s) : 1,21
Data Source : Composition of asbestos brake pads analyzed using neutron activation.

SCC Assignments: 112

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.390	0.480	0.550

Total Particulate Matter -

	Species		0-2.5 um(1)		2.5-10 um(1)		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7440-23-5	11	Na	0.032	0.000	0.032	0.000	0.032	0.000	0.032	0.008
7439-95-4	12	Mg	13.800	0.000	13.800	0.000	13.800	0.000	13.800	0.200
7429-90-5	13	Al	0.215	0.000	0.215	0.000	0.215	0.000	0.215	0.055
7440-21-3	14	Si	10.800	0.000	10.800	0.000	10.800	0.000	10.800	2.160
7782-50-5	17	Cl	0.145	0.000	0.145	0.000	0.145	0.000	0.145	0.015
7440-70-2	20	Ca	1.895	0.000	1.895	0.000	1.895	0.000	1.895	1.705
7440-22-2	21	Sc	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-62-2	23	V	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7440-47-3	24	Cr	0.098	0.000	0.098	0.000	0.098	0.000	0.098	0.022
7439-96-5	25	Mn	0.043	0.000	0.043	0.000	0.043	0.000	0.043	0.003
7439-89-6	26	Fe	4.000	0.000	4.000	0.000	4.000	0.000	4.000	1.095
7440-48-4	27	Co	0.007	0.000	0.007	0.000	0.007	0.000	0.007	0.002
7440-66-6	30	Zn	0.310	0.000	0.310	0.000	0.310	0.000	0.310	0.074
7440-38-2	33	As	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
7726-95-6	35	Br	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-24-6	38	Sr	0.041	0.000	0.041	0.000	0.041	0.000	0.041	0.004
7440-36-0	51	Sb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-39-3	56	Ba	0.922	0.000	0.922	0.000	0.922	0.000	0.922	0.474
7439-91-0	57	La	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-45-1	58	Ce	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
TOTALS:			32.312		32.312		32.312		32.312	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Motor Oil
Profile Number : 34005
Data Quality : E

Control Device : Not Applicable
Reference(s) : 1,23
Data Source : Data taken from Reference 1. For details, consult Reference 23.

SCC Assignments: 112

Mass Fraction Data -		(0-2.5)(2)	(0-6)(2)	(0-10)(2)
	Size Interval (um) :	(0-2.5)(2)	(0-6)(2)	(0-10)(2)
	Mass Fraction :	0.000	0.000	0.000

Total Particulate Matter -

	Species		0-2.5 um(1)		2.5-10 um(1)		0-10 um(1)		Total Measured	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7439-95-4	12	Mg	0.023	0.000	0.023	0.000	0.023	0.000	0.023	0.040
7704-34-9	16	S	0.430	0.000	0.430	0.000	0.430	0.000	0.430	0.230
7782-50-5	17	Cl	0.017	0.000	0.017	0.000	0.017	0.000	0.017	0.024
7440-70-2	20	Ca	0.103	0.000	0.103	0.000	0.103	0.000	0.103	0.109
7439-89-6	26	Fe	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7440-66-6	30	Zn	0.082	0.000	0.003	0.000	0.082	0.000	0.082	0.073
7782-49-2	34	Se	0.003	0.000	0.000	0.000	0.003	0.000	0.003	0.001
7726-95-6	35	Br	0.000	0.000	0.021	0.000	0.000	0.000	0.000	0.000
7440-36-0	51	Sb	0.021	0.000	0.099	0.000	0.021	0.000	0.021	0.021
7440-39-3	56	Ba	0.099	0.000	0.099	0.000	0.099	0.000	0.099	0.156
TOTALS:			0.778		0.795		0.778		0.778	

(1) Estimated / extrapolated.
(2) 0.000 indicates the unavailability of mass fraction data for this profile.

```
PM Profile Speciation Report
------------------------------------------------------------------------------
Profile Name   : Semimetal Disk Brake Pads
Profile Number : 34006
Data Quality   : E
------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1
Data Source    : Sample collected from deposition on wheel of 1986 Acura.
                 Analyzed using XRF.

SCC Assignments: 112

Mass Fraction Data -  Size Interval (um) :     (0-2.5)       (0-6)         (0-10)
                      Mass Fraction      :      0.390        0.480          0.550
------------------------------------------------------------------------------
Total Particulate Matter -
                                                                      Total
                              0-2.5 um(1)  2.5-10 um(1)  0-10 um(1)   Measured
                 Species      -----------  ------------  -----------  -----------
 CAS Number  Num    Sym        %wt    unc    %wt    unc    %wt    unc    %wt    unc
------------------------------------------------------------------------------
  7439-89-6   26    Fe      45.900  0.000 45.900  0.000 45.900  0.000 45.900  3.900
  7440-50-8   29    Cu       2.260  0.000  0.370  0.000  2.260  0.000  2.260  0.180
  7439-98-7   42    Mo       0.370  0.000  0.660  0.000  0.370  0.000  0.370  0.050
  7440-31-5   50    Sn       0.660  0.000  0.660  0.000  0.660  0.000  0.660  0.050
  7440-39-3   56    Ba       3.450  0.000  3.450  0.000  3.450  0.000  3.450  0.190
------------------------------------------------------------------------------
TOTALS:                     52.640        51.040        52.640        52.640
==============================================================================
(1)  Estimated / extrapolated.
```

3.14 HEAVY CONSTRUCTION

Heavy construction is a source of dust emissions that may have substantial temporary impact on local air quality. Building and road construction are the prevalent construction categories with the highest emissions potential. Emissions during the construction of a building or road are associated with land clearing, blasting, ground excavation, cut and fill operations, and the construction of the particular facility itself. Dust emissions vary substantially from day to day depending on the level of activity, the specific operations, and the prevailing weather. A large portion of the emissions result from equipment traffic over temporary roads at the construction site.

PM Profile Speciation Report

Profile Name : Excavation - El Segundo,CA
Profile Number : 44101
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Soil sample from excavation site. Analyzed using XRF.

SCC Assignments: 015

Mass Fraction Data - Size Interval (um) : (0-2.5) (0-6) (0-10)
Mass Fraction : 0.020 0.040 0.080

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	11.513	1.727	9.749	1.462	9.873	0.973	9.873	0.000
7440-21-3	14	Si	24.710	3.707	21.239	3.186	21.483	2.108	21.483	0.000
7723-14-0	15	P	0.033	0.007	0.025	0.005	0.025	0.003	0.025	0.000
7704-34-9	16	S	0.350	0.018	0.108	0.005	0.125	0.014	0.125	0.000
7782-50-5	17	Cl	0.035	0.002	0.019	0.001	0.020	0.002	0.020	0.000
7440-09-7	19	K	1.548	0.077	1.721	0.086	1.709	0.085	1.709	0.000
7440-70-2	20	Ca	1.186	0.059	1.359	0.068	1.347	0.066	1.347	0.000
7440-32-6	22	Ti	0.578	0.032	0.612	0.032	0.609	0.032	0.609	0.000
7440-62-2	23	V	0.025	0.008	0.021	0.007	0.022	0.004	0.022	0.000
7440-47-3	24	Cr	0.023	0.004	0.020	0.002	0.020	0.002	0.020	0.000
7439-96-5	25	Mn	0.112	0.008	0.133	0.007	0.131	0.007	0.131	0.000
7439-89-6	26	Fe	5.243	0.267	5.655	0.285	5.626	0.282	5.626	0.000
7440-02-0	28	Ni	0.009	0.002	0.008	0.001	0.008	0.001	0.008	0.000
7440-50-8	29	Cu	0.008	0.002	0.004	0.001	0.004	0.001	0.004	0.000
7440-66-6	30	Zn	0.023	0.003	0.014	0.001	0.015	0.002	0.015	0.000
7440-55-3	31	Ga	0.001	0.001	0.000	0.002	0.000	0.001	0.000	0.000
7440-38-2	33	As	0.008	0.004	0.000	0.002	0.001	0.001	0.001	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7726-95-6	35	Br	0.000	0.002	0.004	0.001	0.004	0.001	0.004	0.000
7440-17-7	37	Rb	0.000	0.002	0.014	0.001	0.013	0.001	0.013	0.000
7440-24-6	38	Sr	0.020	0.003	0.037	0.002	0.036	0.002	0.036	0.000
7440-65-5	39	Y	0.000	0.003	0.000	0.001	0.000	0.001	0.000	0.000
7440-67-7	40	Zr	0.000	0.016	0.000	0.005	0.000	0.005	0.000	0.000
7439-98-7	42	Mo	0.000	0.009	0.000	0.003	0.000	0.003	0.000	0.000
7440-05-3	46	Pd	0.000	0.010	0.000	0.003	0.000	0.003	0.000	0.000
7440-22-4	47	Ag	0.000	0.012	0.000	0.004	0.000	0.004	0.000	0.000
7440-43-9	48	Cd	0.000	0.017	0.000	0.005	0.000	0.005	0.000	0.000
7440-74-6	49	In	0.000	0.020	0.000	0.006	0.000	0.006	0.000	0.000
7440-31-5	50	Sn	0.000	0.024	0.000	0.008	0.000	0.007	0.000	0.000
7440-36-0	51	Sb	0.040	0.055	0.016	0.017	0.018	0.016	0.018	0.000
7440-39-3	56	Ba	0.000	0.099	0.000	0.032	0.000	0.029	0.000	0.000
7439-91-0	57	La	0.000	0.183	0.000	0.055	0.000	0.053	0.000	0.000
7439-97-6	80	Hg	0.000	0.002	0.000	0.001	0.000	0.001	0.000	0.000
7439-92-1	82	Pb	0.011	0.006	0.024	0.002	0.024	0.002	0.024	0.000
TOTALS:			45.476		40.782		41.113		41.113	

(1) Estimated / extrapolated.

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PM Profile Speciation Report
--------------------------------------------------------------------------------
Profile Name   : Excavation - Haul Road
Profile Number : 44102
Data Quality   : C
--------------------------------------------------------------------------------
Control Device : Not Applicable
Reference(s)   : 1
Data Source    : Soil sample from haul road at highway construction site.
                 Analyzed using XRF.

SCC Assignments: 30100103

Mass Fraction Data -  Size Interval (um) :     (0-2.5)        (0-6)          (0-10)
                      Mass Fraction      :      0.020         0.040           0.080
--------------------------------------------------------------------------------
Total Particulate Matter -
                                                                        Total
                                 0-2.5 um      2.5-10 um      0-10 um     Measured(1)
               Species         ------------  ------------  ------------  ------------
 CAS Number   Num   Sym          %wt    unc    %wt    unc    %wt    unc    %wt    unc
--------------------------------------------------------------------------------
  7429-90-5   13    Al        11.041  1.656 10.292  1.544 10.325  0.993 10.325  0.000
  7440-21-3   14    Si        22.441  3.366 21.196  3.179 21.250  2.036 21.250  0.000
  7723-14-0   15    P          0.033  0.007  0.000  0.000  0.002  0.002  0.002  0.000
  7704-34-9   16    S          0.250  0.013  0.082  0.004  0.090  0.010  0.090  0.000
  7782-50-5   17    Cl         0.087  0.004  0.021  0.001  0.024  0.004  0.024  0.000
  7440-09-7   19    K          1.393  0.070  1.645  0.082  1.634  0.079  1.634  0.000
  7440-70-2   20    Ca         1.371  0.069  1.278  0.064  1.282  0.069  1.282  0.000
  7440-32-6   22    Ti         0.503  0.029  0.551  0.030  0.549  0.028  0.549  0.000
  7440-62-2   23    V          0.025  0.007  0.024  0.006  0.024  0.004  0.024  0.000
  7440-47-3   24    Cr         0.015  0.003  0.023  0.002  0.022  0.002  0.022  0.000
  7439-96-5   25    Mn         0.101  0.007  0.126  0.007  0.125  0.007  0.125  0.000
  7439-89-6   26    Fe         5.112  0.261  5.532  0.279  5.513  0.275  5.513  0.000
  7440-02-0   28    Ni         0.004  0.002  0.008  0.001  0.008  0.001  0.008  0.000
  7440-50-8   29    Cu         0.018  0.003  0.006  0.001  0.007  0.001  0.007  0.000
  7440-66-6   30    Zn         0.079  0.006  0.018  0.001  0.021  0.003  0.021  0.000
  7440-55-3   31    Ga         0.000  0.001  0.000  0.003  0.000  0.002  0.000  0.000
  7440-38-2   33    As         0.021  0.004  0.000  0.002  0.001  0.002  0.001  0.000
  7782-49-2   34    Se         0.000  0.002  0.000  0.000  0.000  0.000  0.000  0.000
  7726-95-6   35    Br         0.000  0.002  0.000  0.000  0.000  0.001  0.000  0.000
  7440-17-7   37    Rb         0.002  0.003  0.013  0.001  0.013  0.001  0.013  0.000
  7440-24-6   38    Sr         0.017  0.004  0.032  0.002  0.031  0.002  0.031  0.000
  7440-65-5   39    Y          0.000  0.004  0.001  0.001  0.001  0.001  0.001  0.000
  7440-67-7   40    Zr         0.000  0.018  0.000  0.004  0.000  0.005  0.000  0.000
  7439-98-7   42    Mo         0.000  0.011  0.000  0.003  0.000  0.003  0.000  0.000
  7440-05-3   46    Pd         0.000  0.012  0.000  0.002  0.000  0.003  0.000  0.000
  7440-22-4   47    Ag         0.000  0.014  0.000  0.003  0.000  0.004  0.000  0.000
  7440-43-9   48    Cd         0.000  0.018  0.000  0.004  0.000  0.005  0.000  0.000
  7440-74-6   49    In         0.000  0.023  0.000  0.005  0.000  0.006  0.000  0.000
  7440-31-5   50    Sn         0.000  0.027  0.000  0.006  0.000  0.007  0.000  0.000
  7440-36-0   51    Sb         0.000  0.056  0.000  0.012  0.000  0.015  0.000  0.000
  7440-39-3   56    Ba         0.000  0.113  0.046  0.024  0.044  0.031  0.044  0.000
  7439-91-0   57    La         0.000  0.202  0.025  0.040  0.024  0.054  0.024  0.000
  7439-97-6   80    Hg         0.000  0.002  0.000  0.000  0.000  0.000  0.000  0.000
  7439-92-1   82    Pb         0.000  0.007  0.024  0.002  0.023  0.002  0.023  0.000
--------------------------------------------------------------------------------
TOTALS:                       42.513        40.943        41.013        41.013
================================================================================
(1)  Estimated / extrapolated.
```

PM Profile Speciation Report

Profile Name : Excavation - Rock Crushing
Profile Number : 44103
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Dust sample collected from rock crushing site. Analyzed using XRF.

SCC Assignments: 30502001

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.150	0.300	0.810

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	11.539	1.731	9.681	1.452	9.857	1.093	9.857	0.000
7440-21-3	14	Si	34.003	5.100	29.414	4.412	29.849	3.277	29.849	0.000
7723-14-0	15	P	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7704-34-9	16	S	0.028	0.001	0.000	0.000	0.003	0.001	0.003	0.000
7782-50-5	17	Cl	0.014	0.001	0.000	0.000	0.001	0.001	0.001	0.000
7440-09-7	19	K	2.715	0.136	2.721	0.136	2.720	0.165	2.720	0.000
7440-70-2	20	Ca	1.509	0.075	1.732	0.087	1.711	0.100	1.711	0.000
7440-32-6	22	Ti	0.359	0.020	0.339	0.022	0.341	0.025	0.341	0.000
7440-62-2	23	V	0.032	0.005	0.008	0.006	0.011	0.004	0.011	0.000
7440-47-3	24	Cr	0.004	0.002	0.007	0.001	0.006	0.002	0.006	0.000
7439-96-5	25	Mn	0.119	0.007	0.117	0.006	0.117	0.010	0.117	0.000
7439-89-6	26	Fe	2.958	0.151	2.908	0.147	2.912	0.179	2.912	0.000
7440-02-0	28	Ni	0.003	0.001	0.003	0.001	0.003	0.001	0.003	0.000
7440-50-8	29	Cu	0.007	0.001	0.005	0.001	0.005	0.002	0.005	0.000
7440-66-6	30	Zn	0.023	0.002	0.010	0.001	0.011	0.002	0.011	0.000
7440-55-3	31	Ga	0.000	0.001	0.000	0.002	0.000	0.001	0.000	0.000
7440-38-2	33	As	0.003	0.002	0.000	0.001	0.000	0.001	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7726-95-6	35	Br	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7440-17-7	37	Rb	0.006	0.002	0.012	0.001	0.012	0.002	0.012	0.000
7440-24-6	38	Sr	0.043	0.003	0.057	0.003	0.056	0.006	0.056	0.000
7440-65-5	39	Y	0.000	0.002	0.000	0.001	0.000	0.001	0.000	0.000
7440-67-7	40	Zr	0.000	0.010	0.000	0.005	0.000	0.004	0.000	0.000
7439-98-7	42	Mo	0.000	0.006	0.000	0.002	0.000	0.002	0.000	0.000
7440-05-3	46	Pd	0.000	0.006	0.000	0.002	0.000	0.002	0.000	0.000
7440-22-4	47	Ag	0.000	0.008	0.000	0.003	0.000	0.003	0.000	0.000
7440-43-9	48	Cd	0.000	0.012	0.000	0.004	0.000	0.004	0.000	0.000
7440-74-6	49	In	0.000	0.012	0.000	0.005	0.000	0.005	0.000	0.000
7440-31-5	50	Sn	0.000	0.015	0.000	0.006	0.000	0.005	0.000	0.000
7440-36-0	51	Sb	0.000	0.034	0.000	0.013	0.000	0.012	0.000	0.000
7440-39-3	56	Ba	0.000	0.063	0.027	0.027	0.025	0.024	0.025	0.000
7439-91-0	57	La	0.000	0.117	0.000	0.043	0.000	0.041	0.000	0.000
7439-97-6	80	Hg	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	0.003	0.004	0.014	0.002	0.013	0.003	0.013	0.000
TOTALS:			53.368		47.055		47.653		47.653	

(1) Estimated / extrapolated.

PM Profile Speciation Report

Profile Name : Soil Dust - Sandblasting & Plastering
Profile Number : 44104
Data Quality : C

Control Device : Not Applicable
Reference(s) : 1
Data Source : Dust sample collected from concrete structure sandblasting, plastering, and wallboarding site. Analyzed using XRF.

SCC Assignments: 015

Mass Fraction Data -		(0-2.5)	(0-6)	(0-10)
	Size Interval (um) :	(0-2.5)	(0-6)	(0-10)
	Mass Fraction :	0.300	0.620	0.850

Total Particulate Matter -

	Species		0-2.5 um		2.5-10 um		0-10 um		Total Measured(1)	
CAS Number	Num	Sym	%wt	unc	%wt	unc	%wt	unc	%wt	unc
7429-90-5	13	Al	5.553	0.833	4.944	0.742	4.984	0.627	4.984	0.000
7440-21-3	14	Si	16.443	2.466	14.210	2.132	14.355	1.817	14.355	0.000
7723-14-0	15	P	0.031	0.006	0.000	0.000	0.002	0.003	0.002	0.000
7704-34-9	16	S	1.982	0.099	1.524	0.076	1.554	0.133	1.554	0.000
7782-50-5	17	Cl	0.022	0.001	0.016	0.001	0.016	0.004	0.016	0.000
7440-09-7	19	K	1.288	0.064	1.353	0.068	1.349	0.100	1.349	0.000
7440-70-2	20	Ca	14.350	0.718	14.212	0.711	14.221	1.011	14.221	0.000
7440-32-6	22	Ti	0.245	0.014	0.223	0.013	0.224	0.023	0.224	0.000
7440-62-2	23	V	0.013	0.003	0.005	0.004	0.005	0.003	0.005	0.000
7440-47-3	24	Cr	0.022	0.002	0.011	0.001	0.012	0.004	0.012	0.000
7439-96-5	25	Mn	0.051	0.004	0.062	0.003	0.061	0.009	0.061	0.000
7439-89-6	26	Fe	2.325	0.118	2.377	0.120	2.374	0.173	2.374	0.000
7440-02-0	28	Ni	0.004	0.001	0.005	0.000	0.004	0.002	0.004	0.000
7440-50-8	29	Cu	0.007	0.001	0.008	0.001	0.008	0.003	0.008	0.000
7440-66-6	30	Zn	0.181	0.010	0.131	0.007	0.134	0.016	0.134	0.000
7440-55-3	31	Ga	0.000	0.001	0.000	0.002	0.000	0.001	0.000	0.000
7440-38-2	33	As	0.006	0.002	0.000	0.001	0.000	0.001	0.000	0.000
7782-49-2	34	Se	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7726-95-6	35	Br	0.000	0.001	0.003	0.000	0.003	0.002	0.003	0.000
7440-17-7	37	Rb	0.000	0.001	0.009	0.001	0.009	0.003	0.009	0.000
7440-24-6	38	Sr	0.028	0.002	0.043	0.002	0.042	0.007	0.042	0.000
7440-65-5	39	Y	0.000	0.002	0.001	0.001	0.001	0.001	0.001	0.000
7440-67-7	40	Zr	0.000	0.008	0.006	0.003	0.005	0.004	0.005	0.000
7439-98-7	42	Mo	0.000	0.005	0.000	0.002	0.000	0.002	0.000	0.000
7440-05-3	46	Pd	0.000	0.005	0.000	0.002	0.000	0.002	0.000	0.000
7440-22-4	47	Ag	0.000	0.007	0.000	0.002	0.000	0.003	0.000	0.000
7440-43-9	48	Cd	0.000	0.008	0.000	0.002	0.000	0.003	0.000	0.000
7440-74-6	49	In	0.000	0.011	0.000	0.003	0.000	0.004	0.000	0.000
7440-31-5	50	Sn	0.000	0.013	0.000	0.004	0.000	0.005	0.000	0.000
7440-36-0	51	Sb	0.000	0.028	0.000	0.008	0.000	0.011	0.000	0.000
7440-39-3	56	Ba	0.000	0.052	0.015	0.015	0.014	0.021	0.014	0.000
7439-91-0	57	La	0.000	0.092	0.000	0.025	0.000	0.036	0.000	0.000
7439-97-6	80	Hg	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000
7439-92-1	82	Pb	0.005	0.003	0.015	0.001	0.015	0.004	0.015	0.000
TOTALS:			42.557		39.173		39.392		39.392	

(1) Estimated / extrapolated.

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SECTION 4

VOC SPECIES PROFILE FORMAT AND APPLICATION

4.1 VOC SPECIES PROFILE FORMAT

Table 4-1 is an example of the format used in presenting the VOC profiles for this document; it is basically the same as that used in the Air Emissions Species Manual - Volume I, VOC Species Profiles. Each of the entries in Table 4-1 is described below:

Profile name: In a majority of the cases, the profile name is the descriptor used for the applicable source category. In cases where a particular profile is applicable to more than one source category, a more general term is used to identify a given profile.

Profile number: This is a unique number assigned arbitrarily to a profile.

Profile data quality: A ranking scheme is employed to assign data quality indicators to each profile. The following criteria were used in assigning data quality indicators:

Data Quality A: Data set based on a composite of several tests using analytical techniques such as GC/MS and can be considered representative of the total population.

Data Quality B: Data set based on a composite of several tests using analytical techniques such as GC/MS and can be considered representative of a large percentage of the total population. Profiles from the VOC field sampling program are assigned data quality "B".

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TABLE 4-1. VOC SAMPLE PROFILE

VOC Profile Speciation Report

Profile Name : Oilfield Pipeline Tanks
Profile Number : 1209
Data Quality : C

Control Device : Internal Floating Roofs with Seals
Reference(s) : 33, 34
Data Source : Four samples of emissions from tanks storing "Oklahoma sweet" crude oil were taken in stainless steel canisters and analyzed using a GC with cryogenic sample pre-concentration and flame ionization detection.

SCC Assignments: 40400302, 40400305

Saroad	CAS Number	Name	Spec_MW	Spec_WT
43202	74-84-0	ETHANE	30.07	3.95
43204	74-98-6	PROPANE	44.09	22.66
43212	106-97-8	N-BUTANE	58.12	13.62
43220	109-66-0	N-PENTANE	72.15	19.21
43229	107-83-5	2-METHYLPENTANE	86.17	2.58
43230	96-14-0	3-METHYL PENTANE	86.17	1.30
43231	110-54-3	HEXANE	86.17	2.74
43232	142-82-5	HEPTANE	100.20	0.56
43233	111-65-9	OCTANE	114.23	0.18
43242	287-92-3	CYCLOPENTANE	70.14	0.61
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.07
43248	110-82-7	CYCLOHEXANE	84.16	0.93
43261	108-87-2	METHYLCYCLOHEXANE	98.21	0.78
43262	96-37-7	METHYLCYCLOPENTANE	84.16	1.13
43263	591-76-4	2-METHYL HEXANE	100.20	0.29
43274	565-59-3	2,3 DIMETHYL PENTANE	100.20	0.09
43276	79-29-8	2,3 DIMETHYLBUTANE	86.17	0.50
43288	1678-91-7	ETHYLCYCLOHEXANE	112.23	0.08
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	0.31
43295	589-34-4	3-METHYLHEXANE	100.20	0.32
43296	592-27-8	2-METHYLHEPTANE	114.23	0.16
43298		3-METHYLHEPTANE	114.23	0.08
43910	75-28-5	2-ME-PROPANE	58.10	2.47
43911	78-78-4	2-ME-BUTANE	72.20	22.50
43912	540-84-1	2,2,4-TRIME-PENTANE	114.20	0.24
45201	71-43-2	BENZENE	78.11	0.08
45202	108-88-3	TOLUENE	92.13	0.12
45203	100-41-4	ETHYLBENZENE	106.16	0.02
45204	95-47-6	O-XYLENE	106.16	0.03
90010		M-XYLENE AND P-XYLENE	106.16	0.12
TOTAL				97.73

Data Quality C: Data set based on a small number of tests using analytical techniques such as GC/MS and can be considered reasonably representative of the total population.

Data Quality D: Data set based on a single source using analytical techniques such as GC/MS; or data set from a number of sources where data are based on engineering calculations.

Data Quality E: Data set based on engineering calculations from one source; data set(s) based on engineering judgement; data set(s) with no documentation provided; may not be considered representative of the total population.

Control device: This entry is used to indicate if the profile data represent an emission stream downstream or upstream of a control device (if present) since the composition of the uncontrolled and controlled streams may be significantly different.

Reference(s): This entry identifies the primary reference(s) used in developing the profiles. If more detailed information is required, the user/reader should consult these references.

Data source: This entry briefly describes the basis of the composition data used in the profile (e.g., number of tests, number of sources, analytical methods, how data were composited, etc.). More detailed information about the data used can be obtained from the references indicated.

SCC: This entry is the code for the source category for which the profile was originally developed. These codes are obtained from the current

National Emission Data System (NEDS) for point sources (1-01-001-01 through 5-03-900-10) and area sources (01 through 64). Area source codes from 65 through 115 developed under NAPAP are also considered.

Composition data: Each species in the profile data is identified by a SAROAD code, CAS number, species name, molecular weight, and weight percentage. SAROAD codes were obtained from Volume V of the Aeros Manual Series (third edition, September 1986). For species not contained in this manual, new SAROAD codes have been assigned following the methodology employed in the Aeros Manual.

Most of the CAS numbers were obtained from the National Air Toxics Information Clearinghouse Data Base (1985) and the Registry of Toxic Effects of Chemical Substances (1983 supplement to the 1981-82 edition). For some species/group of species, CAS numbers were not identified.

Date: This entry will be used to indicate the date the profile was last reviewed/updated by EPA.

4.2 LIMITATIONS OF DATA

The data for the eight new profiles supplied in this addendum are presented as received from the Tulsa City-County Health Department. The data were provided with sufficient documentation and no attempt was made to verify the completeness/accuracy of the data. In some cases, the profiles may not be a full characterization of the emission source. Therefore, the user/reader is cautioned to use these profiles with discretion. Nevertheless, the profile data quality indicator provides a qualitative measure of confidence in a particular profile.

Profiles for individual sources may vary considerably from the values provided in this document. Therefore, profiles in this document should not be used to characterize specific sources; rather, they should be used for screening purposes. Source-specific data should always be preferred to the use of literature data presented in this document.

4.3 VOC SPECIES PROFILE APPLICATION

There are several ongoing EPA activities that require speciated VOC data as an input parameter. These activities include preparation of air toxics emission inventories, ozone strategy development, and preparation of acid precipitation inventories. This section briefly discusses how to use the profiles and provides a specific example to illustrate how to use VOC species profiles in preparation of air toxics emission inventories.

Example of Use of Profile

The easiest way to describe how profiles might be applied is to present a hypothetical example: A State air pollution control agency is interested in developing an air toxics emission inventory for the State. An earlier study conducted for the State has identified a list of toxic/potentially toxic compounds from several emission sources. The emission rates of these individual compounds will be used as an input to the proposed air toxics regulatory program for the State.

The profiles can identify the relative amounts of individual compounds in a given emission stream. In most cases, emission factors are available for total VOC's where the compound breakdown is not specified (e.g., AP-42 or the Criteria Pollutant Emission Factor Document).[1,2] The information contained in the Air Emissions Species Manual supplements these general emissions data. For a given source category, the appropriate VOC species profile should be identified and the total VOC emission factor should be multiplied by the weight fractions for each compound in the profile to determine compound-specific emission factors.

In this example, cyclohexane is one of the toxic compounds on a State's list and crude oil production well heads (gas driven) are a major emissions source. The reader/user can identify the appropriate profile for oil production well heads using Appendix C. However, since all profiles are keyed off of the SCC for the operation, the proper SCC must first be determined.

This can be done by consulting NEDS or the Criteria Pollutant Emission Factor Document. The appropriate SCC for crude oil production well heads is 3-10-001-01. A review of Appendix C indicates that there are four profiles with this SCC, 1205, 1206, 1207, and 1212. Of the four, only Profile 1212 is applicable because it is the only one for gas driven well heads. The weight percentage of cyclohexane in Profile 1212 is 0.68. Applying the weight fraction of cyclohexane to the total VOC emissions for the well head operation of 50,000 lbs/yr, cyclohexane emissions are estimated as 50,000 x 0.0068 = 340 lbs/yr. The reader/user should review the "Data Source" description for the profile to ensure that the data apply to the specific situation on hand. If there are questions, the reader may wish to review the original document on which the profile is based.

4.4 REFERENCES FOR SECTION 4

1. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, AP-42. Fourth Edition. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. September 1985; Supplement A, October 1986; Supplement B, September 1988.

2. U.S. Environmental Protection Agency. Criteria Pollutant Emission Factors for the 1985 NAPAP Emissions Inventory. EPA-600/7-87-015. Office of Research and Development, Air and Energy Engineering Research Laboratory, Research Triangle Park, North Carolina. May 1987.

SECTION 5

VOC SPECIES PROFILES - POINT AND AREA SOURCES

This section contains eight new VOC profiles for the crude oil production industry. These profiles were developed based on source testing information recently gathered by the Tulsa City-County Health Department.[1] Testing was performed on several parts of the crude oil production process including water flood well heads (17 total samples), gas drive well heads (4 total samples), gathering tanks (7 total samples), pipeline storage tanks (4 total samples), tank farm storage tanks (4 total samples), and refinery storage tanks (4 total samples). Thirty specific organic compounds were analyzed for in each sample in addition to total nonmethane hydrocarbons.

An index of the eight oil production profiles is given below.

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Profile 1205 - Crude Oil Production - Well Heads (Water Flood)	273
Profile 1206 - Crude Oil Production - Well Heads (Water Flood)	274
Profile 1207 - Well Heads (Water Flood) Composite	275
Profile 1208 - Crude Oil Production - Gathering Tanks	276
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Profile 1210 - Pipeline Terminal Tanks	278
Profile 1211 - Refinery Crude Oil Storage Tanks	279
Profile 1212 - Crude Oil Production - Well Heads (Gas Drive)	280

Revisions to three existing VOC profiles are also included in this section. The affected profiles, 1101, 1203, and 1204, are all for light-duty gasoline vehicles. Modifications were made to the profiles to correct weight percentage assignment problems caused by compounds that coelute during gas chromatography analyses. The coelution cases that were revised in this Addendum relate to the benzene/cyclohexane split and the pentane/pentene split.[2] The revised profiles given in Section 5.2 should replace the

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similarly numbered profiles currently contained in "Air Emissions Species Manual - Volume I, Volatile Organic Compound (VOC) Species Profiles" (EPA-450/2-88-003a).

5.1 CRUDE OIL PRODUCTION

The oil and gas production industry includes the following processes: exploration and site preparation, drilling, crude processing, natural gas processing, and secondary or tertiary recovery. The principal products of this industry are natural gas and crude oil. Sources of VOC emissions from the crude oil production process include blowouts during drilling operations, storage tank working, standing, breathing, and filling losses, wastewater treatment processes, and fugitive leaks in gauges, fittings, valves, pumps, pipes, and vessels.

VOC Profile Speciation Report

Profile Name : Crude Oil Production - Well Heads (Water Flood)
Profile Number : 1205
Data Quality : C

Control Device : Uncontrolled
Reference(s) : 96
Data Source : Crude comes from the Oklahoma Glen Sand formation which is at a depth of 1500 feet. Nine samples were taken in stainless steel canisters and analyzed using a GC with cryogenic sample pre-concentration and flame ionization detection.

SCC Assignments: 31000101

Saroad	CAS Number	Name	Spec_MW	Spec_WT
43202	74-84-0	ETHANE	30.07	6.27
43204	74-98-6	PROPANE	44.09	18.42
43212	106-97-8	N-BUTANE	58.12	14.74
43220	109-66-0	N-PENTANE	72.15	5.68
43229	107-83-5	2-METHYLPENTANE	86.17	1.49
43230	96-14-0	3-METHYL PENTANE	86.17	0.89
43231	110-54-3	HEXANE	86.17	1.95
43232	142-82-5	HEPTANE	100.20	1.32
43233	111-65-9	OCTANE	114.23	1.02
43242	287-92-3	CYCLOPENTANE	70.14	0.49
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.22
43248	110-82-7	CYCLOHEXANE	84.16	0.77
43261	108-87-2	METHYLCYCLOHEXANE	98.21	1.27
43262	96-37-7	METHYLCYCLOPENTANE	84.16	1.45
43263	591-76-4	2-METHYL HEXANE	100.20	0.39
43274	565-59-3	2,3 DIMETHYL PENTANE	100.20	0.16
43276	79-29-8	2,3 DIMETHYLBUTANE	86.17	0.16
43288	1678-91-7	ETHYLCYCLOHEXANE	112.23	0.47
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	0.05
43295	589-34-4	3-METHYLHEXANE	100.20	0.53
43296	592-27-8	2-METHYLHEPTANE	114.23	0.66
43298		3-METHYLHEPTANE	114.23	0.35
43910	75-28-5	2-ME-PROPANE	58.10	5.36
43911	78-78-4	2-ME-BUTANE	72.20	4.62
43912	540-84-1	2,2,4-TRIME-PENTANE	114.20	0.75
45201	71-43-2	BENZENE	78.11	0.38
45202	108-88-3	TOLUENE	92.13	0.62
45203	100-41-4	ETHYLBENZENE	106.16	0.95
45204	95-47-6	O-XYLENE	106.16	1.35
90010		M-XYLENE AND P-XYLENE	106.16	3.62
TOTAL				76.40

VOC Profile Speciation Report

Profile Name : Crude Oil Production - Well Heads (Water Flood)
Profile Number : 1206
Data Quality : C

Control Device : Uncontrolled
Reference(s) : 96
Data Source : Crude comes from the Oklahoma Redfork formation which is at a depth of 1,300 feet. Eight samples were taken in stainless steel canisters and analyzed using a GC with cryogenic sample pre-concentration and flame ionization detection.

SCC Assignments: 31000101

Saroad	CAS Number	Name	Spec_MW	Spec_WT
43202	74-84-0	ETHANE	30.07	6.74
43204	74-98-6	PROPANE	44.09	16.55
43212	106-97-8	N-BUTANE	58.12	18.78
43220	109-66-0	N-PENTANE	72.15	10.97
43229	107-83-5	2-METHYLPENTANE	86.17	3.29
43230	96-14-0	3-METHYL PENTANE	86.17	1.94
43231	110-54-3	HEXANE	86.17	4.78
43232	142-82-5	HEPTANE	100.20	2.27
43233	111-65-9	OCTANE	114.23	1.06
43242	287-92-3	CYCLOPENTANE	70.14	0.91
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.13
43248	110-82-7	CYCLOHEXANE	84.16	1.43
43261	108-87-2	METHYLCYCLOHEXANE	98.21	1.97
43262	96-37-7	METHYLCYCLOPENTANE	84.16	3.04
43263	591-76-4	2-METHYL HEXANE	100.20	0.74
43274	565-59-3	2,3 DIMETHYL PENTANE	100.20	0.32
43276	79-29-8	2,3 DIMETHYLBUTANE	86.17	0.32
43288	1678-91-7	ETHYLCYCLOHEXANE	112.23	0.26
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	0.09
43295	589-34-4	3-METHYLHEXANE	100.20	1.04
43296	592-27-8	2-METHYLHEPTANE	114.23	0.79
43298		3-METHYLHEPTANE	114.23	0.34
43910	75-28-5	2-ME-PROPANE	58.10	5.48
43911	78-78-4	2-ME-BUTANE	72.20	8.08
43912	540-84-1	2,2,4-TRIME-PENTANE	114.20	1.37
45201	71-43-2	BENZENE	78.11	0.16
45202	108-88-3	TOLUENE	92.13	0.13
45203	100-41-4	ETHYLBENZENE	106.16	0.12
45204	95-47-6	O-XYLENE	106.16	0.04
90010		M-XYLENE AND P-XYLENE	106.16	0.34
TOTAL				93.48

VOC Profile Speciation Report

Profile Name : Well Heads (Water Flood) Composite
Profile Number : 1207
Data Quality : C

Control Device : Uncontrolled
Reference(s) : 96
Data Source : Composite profile developed from Profiles 1205 and 1206.

SCC Assignments: 31000101

Saroad	CAS Number	Name	Spec_MW	Spec_WT
43202	74-84-0	ETHANE	30.07	6.51
43204	74-98-6	PROPANE	44.09	17.48
43212	106-97-8	N-BUTANE	58.12	16.77
43220	109-66-0	N-PENTANE	72.15	8.33
43229	107-83-5	2-METHYLPENTANE	86.17	2.40
43230	96-14-0	3-METHYL PENTANE	86.17	1.42
43231	110-54-3	HEXANE	86.17	3.37
43232	142-82-5	HEPTANE	100.20	1.80
43233	111-65-9	OCTANE	114.23	1.04
43242	287-92-3	CYCLOPENTANE	70.14	0.70
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.18
43248	110-82-7	CYCLOHEXANE	84.16	1.11
43261	108-87-2	METHYLCYCLOHEXANE	98.21	1.63
43262	96-37-7	METHYLCYCLOPENTANE	84.16	2.44
43263	591-76-4	2-METHYL HEXANE	100.20	0.57
43274	565-59-3	2,3 DIMETHYL PENTANE	100.20	0.25
43276	79-29-8	2,3 DIMETHYLBUTANE	86.17	0.24
43288	1678-91-7	ETHYLCYCLOHEXANE	112.23	0.37
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	0.08
43295	589-34-4	3-METHYLHEXANE	100.20	0.80
43296	592-27-8	2-METHYLHEPTANE	114.23	0.73
43298		3-METHYLHEPTANE	114.23	0.35
43910	75-28-5	2-ME-PROPANE	58.10	5.42
43911	78-78-4	2-ME-BUTANE	72.20	6.36
43912	540-84-1	2,2,4-TRIME-PENTANE	114.20	1.07
45201	71-43-2	BENZENE	78.11	0.28
45202	108-88-3	TOLUENE	92.13	0.38
45203	100-41-4	ETHYLBENZENE	106.16	0.54
45204	95-47-6	O-XYLENE	106.16	0.70
90010		M-XYLENE AND P-XYLENE	106.16	1.98
TOTAL				85.30

VOC Profile Speciation Report

Profile Name : Crude Oil Production - Gathering Tanks
Profile Number : 1208
Data Quality : C

Control Device : Uncontrolled
Reference(s) : 96
Data Source : Seven samples from Oklahoma Glen Sand and Dutcher formations were taken in stainless steel canisters and analyzed using a GC with cryogenic sample pre-concentration and flame ionization detection.

SCC Assignments: 40400302

Saroad	CAS Number	Name	Spec_MW	Spec_WT
43202	74-84-0	ETHANE	30.07	9.28
43204	74-98-6	PROPANE	44.09	25.84
43212	106-97-8	N-BUTANE	58.12	20.03
43220	109-66-0	N-PENTANE	72.15	7.30
43229	107-83-5	2-METHYLPENTANE	86.17	1.80
43230	96-14-0	3-METHYL PENTANE	86.17	1.03
43231	110-54-3	HEXANE	86.17	2.20
43232	142-82-5	HEPTANE	100.20	1.21
43233	111-65-9	OCTANE	114.23	0.70
43242	287-92-3	CYCLOPENTANE	70.14	0.51
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.06
43248	110-82-7	CYCLOHEXANE	84.16	0.90
43261	108-87-2	METHYLCYCLOHEXANE	98.21	1.23
43262	96-37-7	METHYLCYCLOPENTANE	84.16	1.48
43263	591-76-4	2-METHYL HEXANE	100.20	0.37
43274	565-59-3	2,3 DIMETHYL PENTANE	100.20	0.16
43276	79-29-8	2,3 DIMETHYLBUTANE	86.17	0.20
43288	1678-91-7	ETHYLCYCLOHEXANE	112.23	0.28
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	0.08
43295	589-34-4	3-METHYLHEXANE	100.20	0.51
43296	592-27-8	2-METHYLHEPTANE	114.23	0.52
43298		3-METHYLHEPTANE	114.23	0.24
43910	75-28-5	2-ME-PROPANE	58.10	7.14
43911	78-78-4	2-ME-BUTANE	72.20	6.29
43912	540-84-1	2,2,4-TRIME-PENTANE	114.20	0.56
45201	71-43-2	BENZENE	78.11	0.12
45202	108-88-3	TOLUENE	92.13	0.23
45203	100-41-4	ETHYLBENZENE	106.16	0.09
45204	95-47-6	O-XYLENE	106.16	0.11
90010		M-XYLENE AND P-XYLENE	106.16	0.46
TOTAL				90.93

VOC Profile Speciation Report

Profile Name : Oilfield Pipeline Tanks
Profile Number : 1209
Data Quality : C

Control Device : Internal Floating Roofs with Seals
Reference(s) : 96
Data Source : Four samples of emissions from tanks storing "Oklahoma sweet" crude oil were taken in stainless steel canisters and analyzed using a GC with cryogenic sample pre-concentration and flame ionization detection.

SCC Assignments: 40400302, 40400305

Saroad	CAS Number	Name	Spec_MW	Spec_WT
43202	74-84-0	ETHANE	30.07	3.95
43204	74-98-6	PROPANE	44.09	22.66
43212	106-97-8	N-BUTANE	58.12	13.62
43220	109-66-0	N-PENTANE	72.15	19.21
43229	107-83-5	2-METHYLPENTANE	86.17	2.58
43230	96-14-0	3-METHYL PENTANE	86.17	1.30
43231	110-54-3	HEXANE	86.17	2.74
43232	142-82-5	HEPTANE	100.20	0.56
43233	111-65-9	OCTANE	114.23	0.18
43242	287-92-3	CYCLOPENTANE	70.14	0.61
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.07
43248	110-82-7	CYCLOHEXANE	84.16	0.93
43261	108-87-2	METHYLCYCLOHEXANE	98.21	0.78
43262	96-37-7	METHYLCYCLOPENTANE	84.16	1.13
43263	591-76-4	2-METHYL HEXANE	100.20	0.29
43274	565-59-3	2,3 DIMETHYL PENTANE	100.20	0.09
43276	79-29-8	2,3 DIMETHYLBUTANE	86.17	0.50
43288	1678-91-7	ETHYLCYCLOHEXANE	112.23	0.08
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	0.31
43295	589-34-4	3-METHYLHEXANE	100.20	0.32
43296	592-27-8	2-METHYLHEPTANE	114.23	0.16
43298		3-METHYLHEPTANE	114.23	0.08
43910	75-28-5	2-ME-PROPANE	58.10	2.47
43911	78-78-4	2-ME-BUTANE	72.20	22.50
43912	540-84-1	2,2,4-TRIME-PENTANE	114.20	0.24
45201	71-43-2	BENZENE	78.11	0.08
45202	108-88-3	TOLUENE	92.13	0.12
45203	100-41-4	ETHYLBENZENE	106.16	0.02
45204	95-47-6	O-XYLENE	106.16	0.03
90010		M-XYLENE AND P-XYLENE	106.16	0.12
TOTAL				97.73

VOC Profile Speciation Report

Profile Name : Pipeline Terminal Tanks
Profile Number : 1210
Data Quality : C

Control Device : Internal Floating Roof with Seal
Reference(s) : 96
Data Source : Four samples from Sinclair Terminal storing "Oklahoma sweet" crude oil were taken in stainless steel canisters and analyzed using a GC with cryogenic sample pre-concentration and flame ionization detection.

SCC Assignments: 40400303, 40400304, 40400305

Saroad	CAS Number	Name	Spec_MW	Spec_WT
43202	74-84-0	ETHANE	30.07	0.35
43204	74-98-6	PROPANE	44.09	3.31
43212	106-97-8	N-BUTANE	58.12	9.57
43220	109-66-0	N-PENTANE	72.15	9.41
43229	107-83-5	2-METHYLPENTANE	86.17	5.26
43230	96-14-0	3-METHYL PENTANE	86.17	3.13
43231	110-54-3	HEXANE	86.17	4.69
43232	142-82-5	HEPTANE	100.20	2.11
43233	111-65-9	OCTANE	114.23	0.67
43242	287-92-3	CYCLOPENTANE	70.14	2.02
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.38
43248	110-82-7	CYCLOHEXANE	84.16	4.57
43261	108-87-2	METHYLCYCLOHEXANE	98.21	5.91
43262	96-37-7	METHYLCYCLOPENTANE	84.16	7.22
43263	591-76-4	2-METHYL HEXANE	100.20	0.98
43274	565-59-3	2,3 DIMETHYL PENTANE	100.20	0.80
43276	79-29-8	2,3 DIMETHYLBUTANE	86.17	1.07
43288	1678-91-7	ETHYLCYCLOHEXANE	112.23	0.61
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	0.30
43295	589-34-4	3-METHYLHEXANE	100.20	1.50
43296	592-27-8	2-METHYLHEPTANE	114.23	1.07
43298		3-METHYLHEPTANE	114.23	0.50
43910	75-28-5	2-ME-PROPANE	58.10	4.51
43911	78-78-4	2-ME-BUTANE	72.20	9.76
43912	540-84-1	2,2,4-TRIME-PENTANE	114.20	3.03
45201	71-43-2	BENZENE	78.11	0.54
45202	108-88-3	TOLUENE	92.13	0.90
45203	100-41-4	ETHYLBENZENE	106.16	0.22
45204	95-47-6	O-XYLENE	106.16	0.16
90010		M-XYLENE AND P-XYLENE	106.16	0.73
TOTAL				85.28

VOC Profile Speciation Report

Profile Name : Refinery Crude Oil Storage Tanks
Profile Number : 1211
Data Quality : C

Control Device : Internal Floating Roof with Seal
Reference(s) : 96
Data Source : Four samples from Sinclair and Sun Refinery crude oil storage tanks were taken in stainless steel canisters and analyzed using a GC with cryogenic sample pre-concentration and flame ionization detection.

SCC Assignments: 40400303, 40400304, 40400305

Saroad	CAS Number	Name	Spec_MW	Spec_WT
43202	74-84-0	ETHANE	30.07	4.51
43204	74-98-6	PROPANE	44.09	18.97
43212	106-97-8	N-BUTANE	58.12	22.71
43220	109-66-0	N-PENTANE	72.15	13.29
43229	107-83-5	2-METHYLPENTANE	86.17	3.12
43230	96-14-0	3-METHYL PENTANE	86.17	1.79
43231	110-54-3	HEXANE	86.17	3.89
43232	142-82-5	HEPTANE	100.20	1.31
43233	111-65-9	OCTANE	114.23	0.34
43242	287-92-3	CYCLOPENTANE	70.14	0.87
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.11
43248	110-82-7	CYCLOHEXANE	84.16	1.24
43261	108-87-2	METHYLCYCLOHEXANE	98.21	1.21
43262	96-37-7	METHYLCYCLOPENTANE	84.16	2.15
43263	591-76-4	2-METHYL HEXANE	100.20	0.50
43274	565-59-3	2,3 DIMETHYL PENTANE	100.20	0.22
43276	79-29-8	2,3 DIMETHYLBUTANE	86.17	0.38
43288	1678-91-7	ETHYLCYCLOHEXANE	112.23	0.11
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	0.16
43295	589-34-4	3-METHYLHEXANE	100.20	0.77
43296	592-27-8	2-METHYLHEPTANE	114.23	0.30
43298		3-METHYLHEPTANE	114.23	0.15
43910	75-28-5	2-ME-PROPANE	58.10	6.06
43911	78-78-4	2-ME-BUTANE	72.20	11.22
43912	540-84-1	2,2,4-TRIME-PENTANE	114.20	0.70
45201	71-43-2	BENZENE	78.11	0.32
45202	108-88-3	TOLUENE	92.13	0.35
45203	100-41-4	ETHYLBENZENE	106.16	0.05
45204	95-47-6	O-XYLENE	106.16	0.04
90010		M-XYLENE AND P-XYLENE	106.16	0.14
TOTAL				96.98

VOC Profile Speciation Report

Profile Name : Crude Oil Production - Well Heads (Gas Drive)
Profile Number : 1212
Data Quality : C

Control Device : Uncontrolled
Reference(s) : 96
Data Source : Crude comes from the Oklahoma Dutcher formation which is at a depth of 1,400 feet. Four samples were taken in stainless steel canisters and analyzed using a GC with cryogenic sample pre-concentration and flame ionization detection.

SCC Assignments: 31000101

Saroad	CAS Number	Name	Spec_MW	Spec_WT
43202	74-84-0	ETHANE	30.07	17.52
43204	74-98-6	PROPANE	44.09	32.63
43212	106-97-8	N-BUTANE	58.12	21.33
43220	109-66-0	N-PENTANE	72.15	6.46
43229	107-83-5	2-METHYLPENTANE	86.17	1.48
43230	96-14-0	3-METHYL PENTANE	86.17	0.83
43231	110-54-3	HEXANE	86.17	1.68
43232	142-82-5	HEPTANE	100.20	0.68
43233	111-65-9	OCTANE	114.23	0.25
43242	287-92-3	CYCLOPENTANE	70.14	0.38
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.05
43248	110-82-7	CYCLOHEXANE	84.16	0.68
43261	108-87-2	METHYLCYCLOHEXANE	98.21	0.74
43262	96-37-7	METHYLCYCLOPENTANE	84.16	1.04
43263	591-76-4	2-METHYL HEXANE	100.20	0.24
43274	565-59-3	2,3 DIMETHYL PENTANE	100.20	0.11
43276	79-29-8	2,3 DIMETHYLBUTANE	86.17	0.17
43288	1678-91-7	ETHYLCYCLOHEXANE	112.23	0.09
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	0.05
43295	589-34-4	3-METHYLHEXANE	100.20	0.32
43296	592-27-8	2-METHYLHEPTANE	114.23	0.23
43298		3-METHYLHEPTANE	114.23	0.10
43910	75-28-5	2-ME-PROPANE	58.10	6.44
43911	78-78-4	2-ME-BUTANE	72.20	5.56
43912	540-84-1	2,2,4-TRIME-PENTANE	114.20	0.32
45201	71-43-2	BENZENE	78.11	0.05
45202	108-88-3	TOLUENE	92.13	0.09
45203	100-41-4	ETHYLBENZENE	106.16	0.02
45204	95-47-6	O-XYLENE	106.16	0.03
90010		M-XYLENE AND P-XYLENE	106.16	0.12
TOTAL				99.69

5.2 MOBILE SOURCES

Because of its widespread use, the internal combustion gasoline powered engine in mobile applications is a major source of VOC emissions. Gasoline fueled light-duty vehicles account for about 75 percent of VOC emissions from mobile sources (1983). Automotive VOC emissions consist of exhaust emissions that occur from the tailpipe, evaporative emissions that occur from (1) the gas tank as the temperature rises during the day, (2) the carburetor after the engine has been shut off (hot soak emissions), and (3) emissions from vehicle refueling.

This section contains revised profiles for light-duty gasoline vehicles-exhaust emissions, light-duty gasoline vehicles-evaporative emissions, and for the light-duty gasoline vehicle composite.

VOC Profile Speciation Report

Profile Name : Light Duty Gasoline Vehicles
Profile Number : 1101
Data Quality : B

Control Device : Catalyst
Reference(s) : 56
Data Source : Composition data collected using GC/FID and DNPH methods for exhaust and evaporative (hot soak) emissions from 45 cars were composited. Based on AP-42 (4th. edition), data were weighted according to travel fractions. (See Appendix A for details).

SCC Assignments:

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak*
43135		C10 PARAFFINS	142.28	0.16	
43136		C9 PARAFFIN	128.25	0.00	(20)
43201	74-82-8	METHANE	16.04	10.07	
43202	74-84-0	ETHANE	30.07	1.41	
43203	74-85-1	ETHYLENE	28.05	3.92	
43204	74-98-6	PROPANE	44.09	0.56	(1)
43205	115-07-1	PROPENE	42.08	1.06	(1)
43206	74-86-2	ACETYLENE	26.04	0.75	
43208	463-49-0	PROPADIENE	40.06	0.08	
43209	74-99-7	METHYLACETYLENE (PROPYNE)	40.06	0.06	
43211	760-20-3	3-METHYL-1-PENTENE	84.16	0.00	(7)
43212	106-97-8	N-BUTANE	58.12	9.48	(3)
43213	106-98-9	BUTENE	56.10	0.85	(2)
43214	75-28-5	ISO-BUTANE	58.12	1.70	
43215	115-11-7	ISOBUTYLENE	56.10	0.00	(2)
43216	624-64-6	T-2-BUTENE	56.11	0.55	(4)
43217	590-18-1	CIS-2-BUTENE	56.11	0.50	(5)
43218	106-99-0	1,3-BUTADIENE	54.09	1.68	(3)
43220	109-66-0	N-PENTANE	72.15	2.88	
43221	78-78-4	ISO PENTANE	72.15	6.54	
43223	563-45-1	3-METHYL-1-BUTENE	70.13	0.15	
43224	109-67-1	1-PENTENE	70.13	0.32	(6)
43226	646-04-8	TRANS-2-PENTENE	70.13	0.68	
43227	627-20-3	CIS-2-PENTENE	70.13	0.38	
43228	513-35-9	2-METHYL-2-BUTENE	70.13	0.98	
43229	107-83-5	2-METHYLPENTANE	86.17	1.76	(8)
43230	96-14-0	3-METHYL PENTANE	86.17	1.09	
43231	110-54-3	HEXANE	86.17	0.87	(10)
43232	142-82-5	HEPTANE	100.20	0.65	
43233	111-65-9	OCTANE	114.23	0.31	
43234	563-78-0	2,3 DIMETHYL-1-BUTENE	84.16	0.00	(8)
43235	111-84-2	NONANE	128.25	0.19	
43238	124-18-5	N-DECANE	142.28	0.16	
43241	1120-21-4	N-UNDECANE	156.31	0.53	
43242	287-92-3	CYCLOPENTANE	70.14	0.35	(7)
43243	78-79-5	ISOPRENE	68.12	0.07	
43245	592-41-6	1-HEXENE	84.16	0.31	(9)
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.58	

VOC Profile Speciation Report - continued (profile 1101)

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak*
43248	110-82-7	CYCLOHEXANE	84.16	1.40	(12)
43250	540-84-1	2,2,4-TRIMETHYLPENTANE	114.22	1.97	
43252	565-75-3	2,3,4-TRIMETHYLPENTANE	114.22	0.12	
43261	108-87-2	METHYLCYCLOHEXANE	98.21	0.50	
43262	96-37-7	METHYLCYCLOPENTANE	84.16	0.78	(11)
43263	591-76-4	2-METHYL HEXANE	100.20	0.00	(13)
43270	922-61-2	3-METHYL-T-2-PENTENE	84.16	0.00	(11)
43272	693-89-0	METHYLCYCLOPENTENE	82.14	0.01	
43273	110-83-8	CYCLOHEXENE	82.14	0.00	(13)
43274	565-59-3	2,3 DIMETHYL PENTANE	100.20	1.40	(13)
43276	79-29-8	2,3 DIMETHYLBUTANE	86.17	0.69	
43277		2,4-DIMETHYLHEXANE	114.22	0.63	(14)
43278	592-13-2	2,5-DIMETHYLHEXANE	114.22	0.00	(14)
43279	760-21-4	2-ETHYL-1-BUTENE	84.16	0.00	(9)
43280		2,3,3 TRIMETHYLPENTANE	114.22	1.09	
43281	107-00-6	1-BUTYNE	54.09	0.00	(5)
43282	503-17-3	2-BUTYNE	54.09	0.00	(6)
43283		C-3-HEXENE	84.16	0.00	(10)
43284	625-27-4	2-METHYL-2-PENTENE	84.16	0.42	
43285		2-HEXENE	84.16	0.16	
43286		DIMETHYLHEXENE	112.20	0.12	
43287	590-73-8	2,2 DIMETHYLHEXANE	114.22	0.05	
43290		2,3 DIMETHYLHEXANE	114.22	0.00	(15)
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	0.21	(4)
43292	142-29-0	CYCLOPENTENE	68.11	0.37	
43295	589-34-4	3-METHYLHEXANE	100.20	1.06	
43296	592-27-8	2-METHYLHEPTANE	114.23	0.19	(16)
43297	589-53-7	4-METHYLHEPTANE	114.23	0.45	
43298		3-METHYLHEPTANE	114.23	0.36	
43299		1-METHYLCYCLOHEXENE	96.17	0.00	(16)
43502	50-00-0	FORMALDEHYDE	30.03	0.74	
43503	75-07-0	ACETALDEHYDE	44.05	0.28	
43504	123-38-6	PROPIONALDEHYDE	58.08	0.02	
43505	107-02-8	ACROLEIN	56.07	0.06	
43515	123-73-9	CROTONALDEHYDE	70.09	0.02	
45110		C10 AROMATIC	134.22	2.02	
45201	71-43-2	BENZENE	78.11	1.39	(12)
45202	108-88-3	TOLUENE	92.13	5.14	(15)
45203	100-41-4	ETHYLBENZENE	106.16	0.77	(18)
45204	95-47-6	O-XYLENE	106.16	1.56	(20)
45205	108-38-3	M-XYLENE	106.16	0.00	(19)
45206	106-42-3	P-XYLENE	106.16	2.56	(19)
45207	108-67-8	1,3,5-TRIMETHYLBENZENE	120.19	1.87	
45208	95-63-6	1,2,4-TRIMETHYLBENZENE	120.19	2.30	
45209	103-65-1	N-PROPYLBENZENE	120.19	0.48	
45216	135-98-8	S-BUTYLBENZENE	134.21	0.11	
45217	135-01-3	1,2 DIETHYLBENZENE	134.22	0.59	
45218	141-93-5	M-DIETHYLBENZENE	134.22	0.59	
45225	526-73-8	1,2,3-TRIMETHYLBENZENE	120.19	0.66	
45501	100-52-7	BENZALDEHYDE	106.13	0.08	
90002		2,3,5-TRIMETHYLHEXANE	128.25	0.09	
90003		2,4 DIMETHYLHEPTANE	128.26	0.11	

VOC Profile Speciation Report - continued (profile 1101)

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak*
90004		3,5 DIMETHYLHEPTANE	128.26	0.00	(17)
90005		2,5 DIMETHYLHEPTANE	128.26	0.73	(17)
90006		2,3 DIMETHYLHEPTANE	128.26	0.00	(18)
90007	691-37-2	4-METHYL-1-PENTENE	84.16	0.00	(7)
90008		2-METHYLOCTANE	128.26	0.01	
90009		2,4,5-TRIMETHYLHEPTANE	142.29	0.26	
90042	13269-52-8	T-3-HEXENE	84.16	0.29	
98033		2,2,5-TRIMETHYLHEXANE	128.26	0.46	
98044	496-11-7	INDANE	118.18	0.52	
99910		2,4 DIMETHYLOCTANE	142.29	0.07	
99911		3,4 DIMETHYLOCTANE	142.29	0.74	
99912		1-METHYL-3-ETHYLBENZENE	120.19	1.06	
99913		1-METHYL-2-ETHYLBENZENE	120.19	0.21	
99915	538-93-2	ISOBUTYLBENZENE	134.22	0.55	
99916		1-METHYL-3N-PROPYLBENZENE	134.22	0.17	
99917		1-METHYL-3-ISOPROPYLBENZENE	134.22	0.38	
99918		2-METHYLDECANE	156.32	1.08	
99999		UNIDENTIFIED	86.00	8.46	
TOTAL				100.04	

*The numbers in the parentheses indicate groups of two or three species identified as a single peak in GC analysis. Only one of the species is assigned the weight percent. It was assumed that 85 percent of peak (3) is due to n-Butane and 15 percent is due to 1,3-Butadiene.

VOC Profile Speciation Report

Profile Name : Light-Duty Gasoline Vehicles - Exhaust
Profile Number : 1203
Data Quality : B

Control Device : Catalyst
Reference(s) : 56, 86
Data Source : Composition data collected using GC/FID and DNPH methods for exhaust emissions (see Appendix A for details; see also Profile 1101).

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak*
43135		C10 PARAFFINS	142.28	0.19	
43136		C9 PARAFFIN	128.25	0.00	(20)
43201	74-82-8	METHANE	16.04	10.97	
43202	74-84-0	ETHANE	30.07	1.79	
43203	74-85-1	ETHYLENE	28.05	8.41	
43204	74-98-6	PROPANE	44.09	0.00	(1)
43205	115-07-1	PROPENE	42.08	2.88	(1)
43206	74-86-2	ACETYLENE	26.04	2.25	
43208	463-49-0	PROPADIENE	40.06	0.13	
43209	74-99-7	METHYLACETYLENE (PROPYNE)	40.06	0.17	
43211	760-20-3	3-METHYL-1-PENTENE	84.16	0.00	(7)
43212	106-97-8	N-BUTANE	58.12	3.81	(3)
43213	106-98-9	BUTENE	56.10	0.00	(2)
43214	75-28-5	ISO-BUTANE	58.12	0.62	
43215	115-11-7	ISOBUTYLENE	56.10	1.41	(2)
43216	624-64-6	T-2-BUTENE	56.11	0.00	(4)
43217	590-18-1	CIS-2-BUTENE	56.11	0.46	(5)
43218	106-99-0	1,3-BUTADIENE	54.09	0.67	(3)
43220	109-66-0	N-PENTANE	72.15	1.60	
43221	78-78-4	ISO PENTANE	72.15	3.51	
43223	563-45-1	3-METHYL-1-BUTENE	70.13	0.18	
43224	109-67-1	1-PENTENE	70.13	0.19	(6)
43226	646-04-8	TRANS-2-PENTENE	70.13	0.34	
43227	627-20-3	CIS-2-PENTENE	70.13	0.20	
43228	513-35-9	2-METHYL-2-BUTENE	70.13	0.51	
43229	107-83-5	2-METHYLPENTANE	86.17	1.27	(8)
43230	96-14-0	3-METHYL PENTANE	86.17	0.86	
43231	110-54-3	HEXANE	86.17	0.67	(10)
43232	142-82-5	HEPTANE	100.20	0.53	
43233	111-65-9	OCTANE	114.23	0.30	
43234	563-78-0	2,3 DIMETHYL-1-BUTENE	84.16	0.00	(8)
43235	111-84-2	NONANE	128.25	0.25	
43238	124-18-5	N-DECANE	142.28	0.20	
43241	1120-21-4	N-UNDECANE	156.31	0.60	
43242	287-92-3	CYCLOPENTANE	70.14	0.00	(7)
43243	78-79-5	ISOPRENE	68.12	0.17	
43245	592-41-6	1-HEXENE	84.16	0.22	(9)
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.53	
43248	110-82-7	CYCLOHEXANE	84.16	1.62	(12)
43250	540-84-1	2,2,4-TRIMETHYLPENTANE	114.22	1.95	
43252	565-75-3	2,3,4-TRIMETHYLPENTANE	114.22	0.11	
43261	108-87-2	METHYLCYCLOHEXANE	98.21	0.47	

VOC Profile Speciation Report - continued (profile 1203)

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak*
43262	96-37-7	METHYLCYCLOPENTANE	84.16	0.61	(11)
43263	591-76-4	2-METHYL HEXANE	100.20	0.00	(13)
43270	922-61-2	3-METHYL-T-2-PENTENE	84.16	0.00	(11)
43272	693-89-0	METHYLCYCLOPENTENE	82.14	0.02	
43273	110-83-8	CYCLOHEXENE	82.14	0.00	(13)
43274	565-59-3	2,3 DIMETHYL PENTANE	100.20	1.25	(13)
43276	79-29-8	2,3 DIMETHYLBUTANE	86.17	0.53	
43277		2,4-DIMETHYLHEXANE	114.22	0.00	(14)
43278	592-13-2	2,5-DIMETHYLHEXANE	114.22	0.63	(14)
43279	760-21-4	2-ETHYL-1-BUTENE	84.16	0.00	(9)
43280		2,3,3 TRIMETHYLPENTANE	114.22	1.10	
43281	107-00-6	1-BUTYNE	54.09	0.00	(5)
43282	503-17-3	2-BUTYNE	54.09	0.00	(6)
43283		C-3-HEXENE	84.16	0.00	(10)
43284	625-27-4	2-METHYL-2-PENTENE	84.16	0.23	
43285		2-HEXENE	84.16	0.08	
43286		DIMETHYLHEXENE	112.20	0.13	
43287	590-73-8	2,2 DIMETHYLHEXANE	114.22	0.07	
43290		2,3 DIMETHYLHEXANE	114.22	0.00	(15)
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	0.71	(4)
43292	142-29-0	CYCLOPENTENE	68.11	0.27	
43295	589-34-4	3-METHYLHEXANE	100.20	0.92	
43296	592-27-8	2-METHYLHEPTANE	114.23	0.22	(16)
43297	589-53-7	4-METHYLHEPTANE	114.23	0.52	
43298		3-METHYLHEPTANE	114.23	0.36	
43299		1-METHYLCYCLOHEXENE	96.17	0.00	(16)
43502	50-00-0	FORMALDEHYDE	30.03	1.42	
43503	75-07-0	ACETALDEHYDE	44.05	0.49	
43504	123-38-6	PROPIONALDEHYDE	58.08	0.05	
43505	107-02-8	ACROLEIN	56.07	0.15	
43515	123-73-9	CROTONALDEHYDE	70.09	0.07	
45110		C10 AROMATIC	134.22	2.65	
45201	71-43-2	BENZENE	78.11	1.62	(12)
45202	108-88-3	TOLUENE	92.13	5.72	(15)
45203	100-41-4	ETHYLBENZENE	106.16	0.88	(18)
45204	95-47-6	O-XYLENE	106.16	1.76	(20)
45205	108-38-3	M-XYLENE	106.16	0.00	(19)
45206	106-42-3	P-XYLENE	106.16	2.87	(19)
45207	108-67-8	1,3,5-TRIMETHYLBENZENE	120.19	2.21	
45208	95-63-6	1,2,4-TRIMETHYLBENZENE	120.19	2.90	
45209	103-65-1	N-PROPYLBENZENE	120.19	0.56	
45216	135-98-8	S-BUTYLBENZENE	134.21	0.17	
45217	135-01-3	1,2 DIETHYLBENZENE	134.22	0.67	
45218	141-93-5	M-DIETHYLBENZENE	134.22	0.57	
45225	526-73-8	1,2,3-TRIMETHYLBENZENE	120.19	0.81	
45501	100-52-7	BENZALDEHYDE	106.13	0.24	
90002		2,3,5-TRIMETHYLHEXANE	128.25	0.11	
90003		2,4 DIMETHYLHEPTANE	128.26	0.13	
90004		3,5 DIMETHYLHEPTANE	128.26	0.00	(17)
90005		2,5 DIMETHYLHEPTANE	128.26	0.00	(17)
90006		2,3 DIMETHYLHEPTANE	128.26	0.00	(18)
90007	691-37-2	4-METHYL-1-PENTENE	84.16	0.25	(7)

VOC Profile Speciation Report - continued (profile 1203)

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak*
90008		2-METHYLOCTANE	128.26	0.02	
90009		2,4,5-TRIMETHYLHEPTANE	142.29	0.45	
90042	13269-52-8	T-3-HEXENE	84.16	0.20	
98033		2,2,5-TRIMETHYLHEXANE	128.26	0.48	
98044	496-11-7	INDANE	118.18	0.54	
99910		2,4 DIMETHYLOCTANE	142.29	0.10	
99911		3,4 DIMETHYLOCTANE	142.29	0.96	
99912		1-METHYL-3-ETHYLBENZENE	120.19	1.25	
99913		1-METHYL-2-ETHYLBENZENE	120.19	0.26	
99915	538-93-2	ISOBUTYLBENZENE	134.22	0.49	
99916		1-METHYL-3N-PROPYLBENZENE	134.22	0.39	
99917		1-METHYL-3-ISOPROPYLBENZENE	134.22	0.51	
99918		2-METHYLDECANE	156.32	1.32	
99999		UNIDENTIFIED	86.00	9.08	
TOTAL				100.04	

*The number in the parentheses indicate groups of two or three species identified as a single peak in GC analysis. Only one of the species is assigned the weight percent. It was assumed that 85 percent of peak (3) is due to n-Butane and 15 percent is due to 1,3-Butadiene.

VOC Profile Speciation Report

Profile Name : Light-Duty Gasoline Vehicles - Evaporative
Profile Number : 1204
Data Quality : B

Control Device :
Reference(s) : 56, 86
Data Source : Composition data collected using GC/FID for evaporative emissions (see Appendix A for details; see also Profile 1101).

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak*
43135		C10 PARAFFINS	142.28	0.09	
43136		C9 PARAFFIN	128.25	0.00	(20)
43201	74-82-8	METHANE	16.04	0.04	
43202	74-84-0	ETHANE	30.07	0.03	
43203	74-85-1	ETHYLENE	28.05	0.03	
43204	74-98-6	PROPANE	44.09	1.54	(1)
43205	115-07-1	PROPENE	42.08	0.00	(1)
43206	74-86-2	ACETYLENE	26.04	0.01	
43208	463-49-0	PROPADIENE	40.06	0.02	
43209	74-99-7	METHYLACETYLENE (PROPYNE)	40.06	0.00	
43211	760-20-3	3-METHYL-1-PENTENE	84.16	0.00	(7)
43212	106-97-8	N-BUTANE	58.12	28.34	(3)
43213	106-98-9	BUTENE	56.10	0.00	(2)
43214	75-28-5	ISO-BUTANE	58.12	6.56	
43215	115-11-7	ISOBUTYLENE	56.10	0.86	(2)
43216	624-64-6	T-2-BUTENE	56.11	0.00	(4)
43217	590-18-1	CIS-2-BUTENE	56.11	0.81	(5)
43218	106-99-0	1,3-BUTADIENE	54.09	0.00	(3)
43220	109-66-0	N-PENTANE	72.15	4.67	
43221	78-78-4	ISO PENTANE	72.15	13.60	
43223	563-45-1	3-METHYL-1-BUTENE	70.13	0.18	
43224	109-67-1	1-PENTENE	70.13	0.62	(6)
43226	646-04-8	TRANS-2-PENTENE	70.13	1.11	
43227	627-20-3	CIS-2-PENTENE	70.13	1.13	
43228	513-35-9	2-METHYL-2-BUTENE	70.13	0.74	
43229	107-83-5	2-METHYLPENTANE	86.17	2.28	(8)
43230	96-14-0	3-METHYL PENTANE	86.17	1.17	
43231	110-54-3	HEXANE	86.17	0.72	(10)
43232	142-82-5	HEPTANE	100.20	0.52	
43233	111-65-9	OCTANE	114.23	0.24	
43234	563-78-0	2,3 DIMETHYL-1-BUTENE	84.16	0.00	(8)
43235	111-84-2	NONANE	128.25	0.12	
43238	124-18-5	N-DECANE	142.28	0.20	
43241	1120-21-4	N-UNDECANE	156.31	0.09	
43242	287-92-3	CYCLOPENTANE	70.14	0.00	(7)
43243	78-79-5	ISOPRENE	68.12	0.00	
43245	592-41-6	1-HEXENE	84.16	0.39	(9)
43247	108-08-7	2,4-DIMETHYLPENTANE	100.20	0.59	
43248	110-82-7	CYCLOHEXANE	84.16	0.67	(12)
43250	540-84-1	2,2,4-TRIMETHYLPENTANE	114.22	0.59	
43252	565-75-3	2,3,4-TRIMETHYLPENTANE	114.22	0.59	
43261	108-87-2	METHYLCYCLOHEXANE	98.21	0.33	

VOC Profile Speciation Report - continued (profile 1204)

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak*
43262	96-37-7	METHYLCYCLOPENTANE	84.16	0.84	(11)
43263	591-76-4	2-METHYL HEXANE	100.20	0.00	(13)
43270	922-61-2	3-METHYL-T-2-PENTENE	84.16	0.00	(11)
43272	693-89-0	METHYLCYCLOPENTENE	82.14	0.07	
43273	110-83-8	CYCLOHEXENE	82.14	0.00	(13)
43274	565-59-3	2,3 DIMETHYL PENTANE	100.20	1.03	(13)
43276	79-29-8	2,3 DIMETHYLBUTANE	86.17	1.04	
43277		2,4-DIMETHYLHEXANE	114.22	0.00	(14)
43278	592-13-2	2,5-DIMETHYLHEXANE	114.22	0.48	(14)
43279	760-21-4	2-ETHYL-1-BUTENE	84.16	0.00	(9)
43280		2,3,3 TRIMETHYLPENTANE	114.22	0.41	
43281	107-00-6	1-BUTYNE	54.09	0.00	(5)
43282	503-17-3	2-BUTYNE	54.09	0.00	(6)
43283		C-3-HEXENE	84.16	0.00	(10)
43284	625-27-4	2-METHYL-2-PENTENE	84.16	0.64	
43285		2-HEXENE	84.16	0.08	
43286		DIMETHYLHEXENE	112.20	0.05	
43287	590-73-8	2,2 DIMETHYLHEXANE	114.22	0.05	
43290		2,3 DIMETHYLHEXANE	114.22	0.00	(15)
43291	75-83-2	2,2-DIMETHYLBUTANE	86.17	1.68	(4)
43292	142-29-0	CYCLOPENTENE	68.11	0.20	
43295	589-34-4	3-METHYLHEXANE	100.20	0.77	
43296	592-27-8	2-METHYLHEPTANE	114.23	0.22	(16)
43297	589-53-7	4-METHYLHEPTANE	114.23	0.10	
43298		3-METHYLHEPTANE	114.23	0.35	
43299		1-METHYLCYCLOHEXENE	96.17	0.00	(16)
43502	50-00-0	FORMALDEHYDE	30.03	0.00	
43503	75-07-0	ACETALDEHYDE	44.05	0.00	
43504	123-38-6	PROPIONALDEHYDE	58.08	0.00	
43505	107-02-8	ACROLEIN	56.07	0.00	
43515	123-73-9	CROTONALDEHYDE	70.09	0.00	
45110		C10 AROMATIC	134.22	0.63	
45201	71-43-2	BENZENE	78.11	0.66	(12)
45202	108-88-3	TOLUENE	92.13	8.51	(15)
45203	100-41-4	ETHYLBENZENE	106.16	0.53	(18)
45204	95-47-6	O-XYLENE	106.16	0.87	(20)
45205	108-38-3	M-XYLENE	106.16	0.00	(19)
45206	106-42-3	P-XYLENE	106.16	2.11	(19)
45207	108-67-8	1,3,5-TRIMETHYLBENZENE	120.19	0.71	
45208	95-63-6	1,2,4-TRIMETHYLBENZENE	120.19	1.21	
45209	103-65-1	N-PROPYLBENZENE	120.19	0.36	
45216	135-98-8	S-BUTYLBENZENE	134.21	0.16	
45217	135-01-3	1,2 DIETHYLBENZENE	134.22	0.13	
45218	141-93-5	M-DIETHYLBENZENE	134.22	0.13	
45225	526-73-8	1,2,3-TRIMETHYLBENZENE	120.19	0.17	
45501	100-52-7	BENZALDEHYDE	106.13	0.00	
90002		2,3,5-TRIMETHYLHEXANE	128.25	0.07	
90003		2,4 DIMETHYLHEPTANE	128.26	0.05	
90004		3,5 DIMETHYLHEPTANE	128.26	0.00	(17)
90005		2,5 DIMETHYLHEPTANE	128.26	0.00	(17)
90006		2,3 DIMETHYLHEPTANE	128.26	0.00	(18)
90007	691-37-2	4-METHYL-1-PENTENE	84.16	1.49	(7)

VOC Profile Speciation Report - continued (profile 1204)

Saroad	CAS Number	Name	Spec_MW	Spec_WT	Peak*
90008		2-METHYLOCTANE	128.26	0.00	
90009		2,4,5-TRIMETHYLHEPTANE	142.29	0.15	
90042	13269-52-8	T-3-HEXENE	84.16	0.13	
98033		2,2,5-TRIMETHYLHEXANE	128.26	0.38	
98044	496-11-7	INDANE	118.18	0.13	
99910		2,4 DIMETHYLOCTANE	142.29	0.20	
99911		3,4 DIMETHYLOCTANE	142.29	0.40	
99912		1-METHYL-3-ETHYLBENZENE	120.19	0.95	
99913		1-METHYL-2-ETHYLBENZENE	120.19	0.04	
99915	538-93-2	ISOBUTYLBENZENE	134.22	0.03	
99916		1-METHYL-3N-PROPYLBENZENE	134.22	0.02	
99917		1-METHYL-3-ISOPROPYLBENZENE	134.22	0.13	
99918		2-METHYLDECANE	156.32	0.21	
99999		UNIDENTIFIED	86.00	2.61	
TOTAL				100.06	

*The numbers in the parentheses indicate groups of two or three species identified as a single peak in GC analysis. Only one of the species is assigned the weight percent.

5.3 REFERENCES FOR VOC PROFILES

1. Viswanath, R.S. and J.H. Van Sandt. Oil Field Emissions of Volatile Organic Compounds. EPA-450/2-89-007. Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina. April 1989.

2. Memorandum from Gray, C. L., U. S. Environmental Protection Agency to J. Calcagni, U. S. Environmental Protection Agency and W. Laxton, U. S. Environmental Protection Agency. March 23, 1989. Motor Vehicle VOC Speciation for SIP Development.

APPENDIX A
PM PROFILE CALCULATIONS

This appendix provides details of the procedures used for calculating composition data for the 0-10 um size interval and uncertainty associated with composition data for the 0-10 um size range. The calculational procedures are based on the methodologies outlined in the Air Emissions Species Manual, Volume II. The assumptions used in filling profile data gaps are also discussed. The calculations discussed in this appendix involve combining composition data reported by a number of different sources with size distribution data compiled primarily from AP-42. An additional uncertainty is introduced into the calculations since the composition data and size distribution data were developed for different sources.

In addition to procedures for calculating composition data for the 0-10 um size range, a methodology that can be used to estimate composition data for the 2.5-6 um and 6-10 um size intervals is also presented. However, as discussed below, the application of this methodology is limited.

A.1 CALCULATION OF COMPOSITION DATA FOR PM_{10} (0-10 um)

According to the Air Emissions Species Manual, Volume II, page B-1, PM_{10} composition is calculated as:

$$A_{iJ,0-10} = (F_{2.5J}/F_{10J})\, A_{iJ,0-2.5} + [1 - (F_{2.5J}/F_{10J})]\, A_{iJ,2.5-10} \quad (1)$$

Where:

$A_{iJ,0-10}$ = PM_{10} composition data (weight percent) for species i in emissions from source J

$F_{2.5J}$ = fraction of mass in the 0-2.5 um size interval in source J emissions

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F_{10J} = fraction of mass in the 0-10 um size interval in source J emissions

$A_{iJ,0-2.5}$ = composition data (weight percent) for fine fraction (<2.5 um) for species i in emissions from source J

$A_{iJ,2.5-10}$ = composition data (weight percent) for coarse fraction (2.5-10 um) for species i in source J

This equation is derived from the following basic relationship:

$$NEM_{iJ,0-10} = NEM_{iJ,0-2.5} + NEM_{iJ,2.5-10} \qquad (2)$$

where NEM is defined as the normalized elemental mass (mass fraction x weight percent). For example,

$$NEM_{iJ,0-10} = F_{10J} \times A_{iJ,0-10} \qquad (3)$$

As shown schematically in Figure 1, a plot of NEM versus particle size would lead to a curve increasing with particle size. Equation (1) is illustrated below for Profile 17108:

Let:

J = Municipal Incinerator (MI) - Profile 17108

i = Al (aluminum)

$F_{2.5,MI}$ = 0.26 (see Profile 17108)

$F_{10,MI}$ = 0.38 (see Profile 17108)

$A_{Al,MI,0-2.5}$ = 0.230 (see Profile 17108)

$A_{Al,MI,2.5-10}$ = 5.200 (see Profile 17108)

Then:

$$A_{Al,MI,0-10} = (0.26/0.38)\ (0.230) + [1 - (0.26/0.38)]\ 5.200$$

$$A_{Al,MI,0-10} = 0.157 + 1.642 = 1.799 \text{ percent}$$

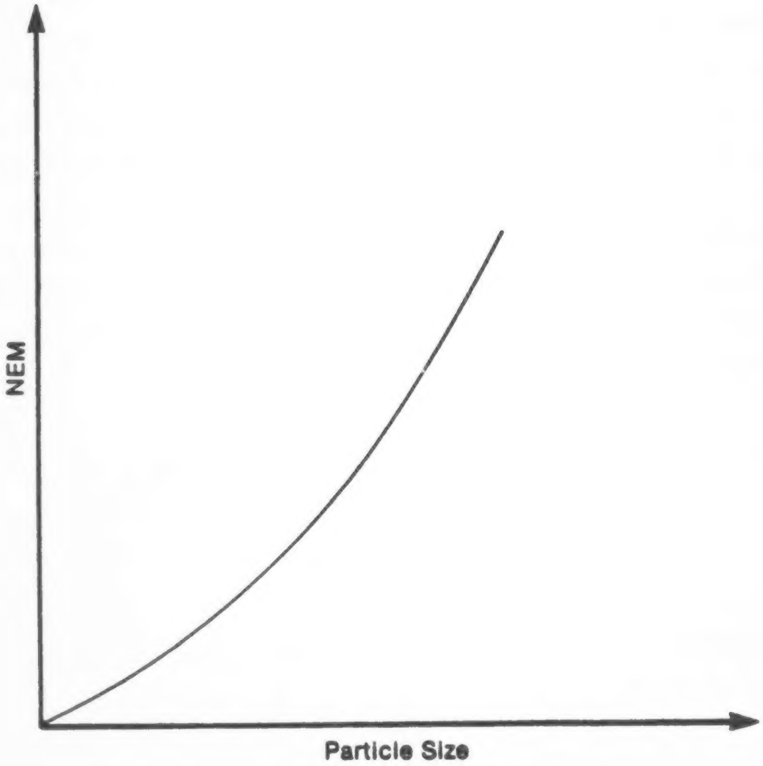

Figure 1. Normalized Elemental Size versus Particle Size

A.2 CALCULATION OF COMPOSITION DATA FOR THE 2.5-6 um AND 6-10 um INTERVALS

As indicated above, the application of the following methodology for estimating composition data for the 2.5-6 um and 6-10 um size intervals from data for the 2.5-10 um size interval is limited. This limitation is largely due to the fact that the mass fraction data and composition data used in these calculations are from different sets of data and represent different emission sources.

Having estimated the PM_{10} composition and $NEM_{iJ,0-10}$, a simple linear relationship can be assumed to exist between $NEM_{iJ,0-2.5}$ and $NEM_{iJ,0-10}$ over the size interval 2.5-10 um. The equation for this relationship can be represented by the following:

$$NEM_{iJ,0-X} = \frac{(NEM_{iJ,0-10} - NEM_{iJ,0-2.5})}{(10 - 2.5)} (X - 2.5) + NEM_{iJ,0-2.5} \qquad (4)$$

Where X is the particle size of interest.

Substituting X = 6 um will yield $NEM_{iJ,0-6}$ which can be used in the following equation to solve for $A_{iJ,2.5-6}$.

$$NEM_{iJ,0-6} = NEM_{iJ,0-2.5} + NEM_{iJ,2.5-6} \qquad (5)$$

Similarly, the value for $A_{iJ,6-10}$ can be estimated from Equation (6):

$$NEM_{iJ,0-10} = NEM_{iJ,0-6} + NEM_{iJ,6-10} \qquad (6)$$

Using the same example data set,

$$NEM_{Al,MI,0-6} = \frac{(NEM_{Al,MI,0-10} - NEM_{Al,MI,0-2.5})}{(10 - 2.5)} (6 - 2.5) + NEM_{Al,MI,0-2.5}$$

$$= \frac{[(0.38 \times 1.799) - (0.26 \times 0.230)]}{7.5} (3.5) + (0.26 \times 0.230)$$

$$NEM_{Al,MI,0-6} = 0.291 + 0.060 = 0.351$$

From Equation (5),

$$NEM_{A1,MI,0-6} = NEM_{A1,MI,0-2.5} + NEM_{A1,MI,2.5-6}$$

$$0.351 = (0.26 \times 0.230) + (F_{2.5-6,MI} \times A_{A1,MI,2.5-6})$$

$$F_{2.5-6,MI} = F_{6,MI} - F_{2.5,MI}$$

$F_{6,MI} = 0.31$ (see Profile 17108)

$F_{2.5,MI} = 0.26$ (see Profile 17108)

$$F_{2.5-6,MI} = 0.05$$

Therefore,

$A_{A1,MI,2.5-6} = (0.351 - 0.060) / 0.05 = 5.824$ percent

Using Equation (6),

$$NEM_{A1,MI,0-10} = NEM_{A1,MI,0-6} + NEM_{A1,MI,6-10}$$

$$(0.38 \times 1.799) = 0.351 + F_{6-10,MI} \times A_{A1,MI,6-10}$$

$$F_{6-10,MI} = F_{10,MI} - F_{6,MI}$$

$$F_{6-10,MI} = 0.38 - 0.31 = 0.07$$

$A_{A1,MI,6-10} = (0.684 - 0.351) / 0.07 = 4.752$ percent

A.3 CALCULATION OF UNCERTAINTY ASSOCIATED WITH COMPOSITION DATA FOR PM_{10}

According to the Receptor Model Source Composition Library, page II-35, the uncertainty of the PM_{10} composition data can be calculated by propagation of errors in quadrature as follows:

$$\begin{aligned}\sigma iJ,10 = [&(A_{1J,0-2.5} / F_{10J})^2 \sigma^2_{F2.5J} + (F_{2.5J} / F^2_{10J})^2 A^2_{1J,0-2.5} \sigma^2_{F10J} \\ &+ (F_{2.5J} / F_{10J})^2 \sigma^2_{A1J,0-2.5} + (A_{1J,2.5-10} / F_{10J}) \sigma^2_{F2.5J} \\ &+ (F_{2.5J} / F^2_{10J})^2 A^2_{1J,2.5-10} \sigma^2_{F10J} \\ &+ (F_{2.5J} / F_{10J}) \sigma^2_{A1J,2.5-10}]^{1/2} \qquad (7)\end{aligned}$$

Where $\sigma^2_{F2.5J}$ and σ^2_{F10J} denote the variances associated with mass fraction data for the 0-2.5 um and 0-10 um size intervals and $\sigma^{2}_{AiJ,0-2.5}$ and $\sigma^{2}_{AiJ,2.5-10}$ represent the variances associated with the composition data for the fine and coarse size fractions. This equation is illustrated below for Profile 17108:

Let:

J = Municipal Incinerator (MI) - Profile 17108

i = K (potassium)

$F_{2.5,MI}$ = 0.26 (see Profile 17108)

$F_{10,MI}$ = 0.38 (see Profile 17108)

$A_{K,MI,0-2.5}$ = 7.600 (see Profile 17108)

$A_{K,MI,2.5-10}$ = 4.500 (see Profile 17108)

,MI,0-2.5 = 2.300 (see Profile 17108)

,MI,2.5-10 = 0.600 (see Profile 17108)

Since $\sigma F2.5,MI$ and $\sigma F10,MI$ are not available, assume the following:

$\sigma F2.5,MI = 0.1\ F2.5,MI = 0.026$

$\sigma F10,MI = 0.1\ F10,MI = 0.038$

Then:

$$\begin{aligned}\sigma K,MI,10 &= [(7.60/0.38)^{2}\ (0.026)^{2} + (0.26/0.382)^{2}\ (7.60)^{2}\ (0.038)^{2}\\ &\quad + (0.26/0.38)^{2}\ (2.30)^{2} + (4.50/0.38)\ (0.026)^{2}\\ &\quad + (0.26/0.38^{2})^{2}\ (4.50)^{2}\ (0.038)^{2} + (0.26/0.38)\ (0.600)^{2}]^{1/2}\\ &= [0.2704 + 0.2704 + 2.4765 + 0.0080 + 0.0948 + 0.2463]^{1/2}\\ &= (3.3664)^{1/2} = 1.835\end{aligned}$$

A.4 ASSUMPTIONS USED IN FILLING DATA GAPS

In several profiles, composition data information for one or two size intervals were not reported. To increase the usefulness of the profiles, certain assumptions were employed to fill these data gaps.

- If data are reported for a single size interval, assume data for the other two intervals are the same. Values for the 0-10 um size interval are also assumed to be the same.
- If data for the 0-2.5 um size interval are missing, assume the data for the 2.5-10 um size interval can be substituted and vice versa. Values for the 0-10 um size interval are also assumed to be the same.
- If data for the total particulate measured are not reported, assume the estimated data for the 0-10 um size fraction can be substituted.

These assumptions are indicated on each profile with appropriate footnotes.

APPENDIX B
PARTICLE SIZE DISTRIBUTION DATA

This appendix discusses how the particle size distribution data (i.e., fraction of mass in a given size interval) presented in the PM profiles in Section 3.0 are compiled. The mass fraction data can be coupled with the size-specific composition data in a given profile to estimate size-specific and speciated particulate emissions.

A large portion of the particle size distribution data were obtained from Supplement A of AP-42. Mass fraction data for about 60 percent of the PM profiles in this update were extracted from AP-42. For several profiles, only generic particle size distribution data were identified in Supplement A of AP-42.

Data from other sources were used to characterize those profiles for which mass fraction data did not exist in Supplement A of AP-42. Table B-1 presents a listing of profile numbers, information sources for the mass fraction data, and data quality indicators. The quality indicators are primarily based on the ratings used in Supplement A of AP-42 for cumulative size-specific emission factors. The ratings designated for the size-specific emission factors are assumed to represent the quality associated with the particle size distribution data.

Data based on generic size distributions in AP-42 are assigned a rating of "D" whereas the default value is assigned a rating of "E." The default value is the same distribution used in the Air Emissions Species Manual, Volume II and represents the overall average of the size distribution data based on all the profiles in that report. It is used for profiles where no size distribution data were identified.

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TABLE B-1. SOURCES OF MASS FRACTION DATA

Profile Number	Mass Fraction Data Quality	Information Source
11202	C	AP-42 (Reference 1)
11203	E	AP-42 (Reference 1)
11204	D	AP-42 (Reference 1)
11205	D	AP-42 (Reference 1)
11206	D	AP-42 (Reference 1)
11207	D	AP-42 (Reference 1)
11208	D	AP-42 (Reference 1)
11209	D	AP-42 (Reference 1)
11210	D	AP-42 (Reference 1)
11211	C	AP-42 (Reference 1)
11212	E	AP-42 (Reference 1)
11213	D	AP-42 (Reference 1)
11214	C	Based on data from Profiles 11202 and 11211
11215	D	Based on data from Profiles 11204-11208, 11210, and 11212
11301	D	AP-42 (Reference 1)
11502	C	AP-42 (Reference 1)
11503	C	AP-42 (Reference 1)
11504	C	AP-42 (Reference 1)
11505	C	AP-42 (Reference 1)

TABLE B-1. SOURCES OF MASS FRACTION DATA (Continued)

Profile Number	Mass Fraction Data Quality	Information Source
11506	C	AP-42 (Reference 1)
11507	C	AP-42 (Reference 1)
11508	C	AP-42 (Reference 1)
11509	C	AP-42 (Reference 1)
11510	C	Based on data from Profiles 11502-11509
12301	E	Based on AP-42 (Reference 1) data for distillate oil firing
12705	E	AP-42 (Reference 1)
13502	E	Based on AP-42 (Reference 1) data for residual oil firing
13503	E	AP-42 (Reference 1)
13504	D	AP-42 (Reference 1)
14101	E	Based on AP-42 (Reference 1) data for residual oil firing
14102	E	Based on AP-42 (Reference 1) data for residual oil firing
15101	E	AP-42 (Reference 1)
17107	D	AP-42 (Reference 1)
17108	D	AP-42 (Reference 1)
17109	E	Default value
20103	D	AP-42 (Reference 1) - generic size distribution

TABLE B-1. SOURCES OF MASS FRACTION DATA (Continued)

Profile Number	Mass Fraction Data Quality	Information Source
20402	D	AP-42 (Reference 1)
20403	D	AP-42 (Reference 1)
20404	D	AP-42 (Reference 1)
20405	D	AP-42 (Reference 1)
20406	E	Based on data from Profile 20403
20503	D	AP-42 (Reference 1) - generic size distribution
25408	D	AP-42 (Reference 1) - generic size distribution
25409	E	AP-42 (Reference 1)
25410	C	AP-42 (Reference 1)
25411	D	AP-42 (Reference 1) - generic size distribution
25412	D	AP-42 (Reference 1) - generic size distribution
25413	D	AP-42 (Reference 1) - generic size distribution
25414	D	AP-42 (Reference 1) - generic size distribution
25415	D	AP-42 (Reference 1) - generic size distribution
25701	D	AP-42 (Reference 1) - generic size distribution
25702	D	AP-42 (Reference 1) - generic size distribution

TABLE B-1. SOURCES OF MASS FRACTION DATA (Continued)

Profile Number	Mass Fraction Data Quality	Information Source
25703	D	AP-42 (Reference 1) - generic size distribution
26203	D	AP-42 (Reference 1) - generic size distribution
26204	D	AP-42 (Reference 1) - generic size distribution
26205	D	AP-42 (Reference 1) - generic size distribution
26206	D	AP-42 (Reference 1) - generic size distribution
26207	D	AP-42 (Reference 1) - generic size distribution
26208	D	AP-42 (Reference 1) - generic size distribution
26209	D	Based on data from Profiles 26203-26205
27204	D	AP-42 (Reference 1) - generic size distribution
27205	D	AP-42 (Reference 1) - generic size distribution
27502	D	AP-42 (Reference 1) - generic size distribution
27503	D	AP-42 (Reference 1) - generic size distribution
27601	D	AP-42 (Reference 1) - generic size distribution
27602	D	AP-42 (Reference 1) - generic size distribution

TABLE B-1. SOURCES OF MASS FRACTION DATA (Continued)

Profile Number	Mass Fraction Data Quality	Information Source
28304	C	AP-42 (Reference 1)
28306	D	AP-42 (Reference 1)
28307	C	AP-42 (Reference 1)
29203	D	AP-42 (Reference 1)
29204	E	AP-42 (Reference 1)
29205	E	AP-42 (Reference 1)
29206	E	AP-42 (Reference 1)
29207	D	AP-42 (Reference 1) - generic size distribution
29208	D	AP-42 (Reference 1)
29209	D	AP-42 (Reference 1)
29210	D	Based on data from Profiles 29203 and 29204
29211	E	Based on data from Profiles 29205 and 29206
29310	D	AP-42 (Reference 1)
29311	D	AP-42 (Reference 1)
29501	D	AP-42 (Reference 1) - generic size distribution
29502	D	AP-42 (Reference 1) - generic size distribution
31103	C	AP-42 (Reference 2)

TABLE B-1. SOURCES OF MASS FRACTION DATA (Continued)

Profile Number	Mass Fraction Data Quality	Information Source
31104	C	AP-42 (Reference 2)
31105	C	Based on data from Profiles 31103 and 31104
31202	C	AP-42 (Reference 2)
31203	C	AP-42 (Reference 2)
32102	C	AP-42 (Reference 2)
32103	C	AP-42 (Reference 2)
32104	C	Based on data from Profiles 32102 and 32103
32203	C	AP-42 (Reference 2)
32204	C	AP-42 (Reference 2)
32205	C	AP-42 (Reference 2)
32206	C	Based on data from Profiles 32204 and 32205
33004	D	Based on data from Reference 3
33005	D	Based on data from Reference 3
33006	D	Based on data from Reference 3
33007	D	Based on data from Reference 3
33008	D	Based on data from Reference 3
33009	D	Based on data from Reference 3
33010	D	Based on data from Reference 3

TABLE B-1. SOURCES OF MASS FRACTION DATA (Continued)

Profile Number	Mass Fraction Data Quality	Information Source
33011	D	Based on data from Profiles 33004-33009
34003	E	Default value
34004	E	Default value
34005	E	Default value
34006	E	Default value
41111	D	Extrapolated from data in Reference 4
41112	D	Extrapolated from data in Reference 4
41113	D	Extrapolated from data in Reference 4
41114	D	Extrapolated from data in Reference 4
41115	D	Extrapolated from data in Reference 4
41116	D	Extrapolated from data in Reference 4
41117	D	Extrapolated from data in Reference 4
41118	D	Extrapolated from data in Reference 4
41119	D	Extrapolated from data in Reference 4
41120	D	Extrapolated from data in Reference 4
41121	D	Extrapolated from data in Reference 4
41122	D	Extrapolated from data in Reference 4
41123	D	Extrapolated from data in Reference 4
41124	D	Extrapolated from data in Reference 4
41131	D	Extrapolated from data in Reference 4

TABLE B-1. SOURCES OF MASS FRACTION DATA (Continued)

Profile Number	Mass Fraction Data Quality	Information Source
41132	D	Extrapolated from data in Reference 4
41133	D	Extrapolated from data in Reference 4
41134	D	Extrapolated from data in Reference 4
41135	D	Extrapolated from data in Reference 4
41136	D	Extrapolated from data in Reference 4
41137	D	Extrapolated from data in Reference 4
41205	D	Extrapolated from data in Reference 4
41321	D	Extrapolated from data in Reference 5
41322	D	Extrapolated from data in Reference 5
41323	D	Extrapolated from data in Reference 5
41324	D	Extrapolated from data in Reference 5
41351	D	Extrapolated from data in Reference 5
42305	D	Extrapolated from data in Reference 5
42306	D	Extrapolated from data in Reference 5
42307	D	Extrapolated from data in Reference 5
42308	D	Extrapolated from data in Reference 5
42309	D	Extrapolated from data in Reference 5
42310	D	Extrapolated from data in Reference 5
42311	D	Extrapolated from data in Reference 5
42312	D	Extrapolated from data in Reference 5

TABLE B-1. SOURCES OF MASS FRACTION DATA (Continued)

Profile Number	Mass Fraction Data Quality	Information Source
42313	D	Extrapolated from data in Reference 5
42314	D	Extrapolated from data in Reference 5
42315	D	Extrapolated from data in Reference 5
42316	D	Extrapolated from data in Reference 5
42317	C	Based on data from Reference 6
42318	C	Based on data from Reference 6
42319	C	Based on data from Profiles 42317 and 42318
43304	E	Based on data from Profile 41351
43305	E	Based on data from Profile 41351
43306	E	Based on data from Profile 41351
43307	E	Based on data from Profile 41351
43308	E	Based on data from Profile 41351
43309	E	Based on data from Profile 41351
44101	E	Based on data from Profile 41351
44102	E	Based on data from Profile 41351
44103	D	AP-42 (Reference 1) - generic size distribution
44104	D	AP-42 (Reference 1) - generic size distribution

APPENDIX B REFERENCES

1. AP-42 (GPO 055-000-00251-7), Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fourth Edition, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1985.

2. AP-42 (GPO 055-000-00252-5), Compilation of Air Pollutant Emission Factors, Volume II, Mobile Sources, Fourth Edition, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1985 (Appendix L).

3. U. S. Environmental Protection Agency. Air Emissions Species Manual, Volume II, Particulate Matter Species Profiles. Publication No. EPA-450/2-88-003b, Research Triangle Park, NC, April 1988, page 314.

4. Anthropogenic Sources and Emissions of Alkaline Particulate Matter in Canada (Prepared by Meteorological and Environmental Planning, Ltd. and Ontario Research Foundation for Air Pollution Control Directorate), 1984.

5. National Inventory of Natural Sources and Emissions of Alkaline Particulates (Prepared by the Environmental Applications Group, Ltd. for Environment Canada), 1982.

6. Rau, J. A. and J. J. Huntzicker, Oregon Graduate Center, Size Distribution and Chemical Composition of Residential Wood Smoke, Presented at the 78th Annual Meeting of the Air Pollution Control Association, Detroit, MI, June 16-21, 1985.

APPENDIX C

ASSIGNMENT OF SOURCE CLASSIFICATION AND AREA SOURCE CODES BY PROFILE NUMBER

TABLE C-1. SOURCE CLASSIFICATION CODE ASSIGNMENTS

SCC	SCC DESCRIPTION	PROFILE NUMBER	DATA QUALITY	DOCUMENT PAGE NUMBER
10100201	EXTERNAL COMBUSTION BOILERS ELECTRIC GENERATION-BITUMINOUS COAL-PULVERIZED COAL,WET BOTTOM	11202	D	27
10100201	" "	11203	C	29
10100201	" "	11204	C	30
10100201	" "	11205	C	32
10100201	" "	11206	C	33
10100201	" "	11207	C	34
10100201	" "	11208	E	35
10100201	" "	11209	E	36
10100201	" "	11210	E	37
10100201	" "	11211	E	38
10100201	" "	11213	E	40
10100201	" "	11214	E	41
10100201	" "	11215	D	42
10100201	" "	11301	D	43
10100203	EXTERNAL COMBUSTION BOILERS-ELECTRIC GENERATION-BITUMINOUS COAL-CYCLONE	11212	E	39
10100401	EXTERNAL COMBUSTION BOILERS-ELECTRIC GENERATION-RESIDUAL OIL-GRADE 6 OIL:NORMAL FIRING	11502	E	45
10100401	" "	11503	E	47
10100401	" "	11504	E	49
10100401	" "	11505	E	51
10100401	" "	11506	E	53
10100401	" "	11507	D	55
10100401	" "	11508	D	57
10100401	" "	11509	D	58
10100401	" "	11510	E	60
10101201	EXTERNAL COMBUSTION BOILERS-ELECTRIC GENERATION-SOLID WASTE-SPECIFY WASTE MATERIAL	11301	D	43
10200401	EXTERNAL COMBUSTION BOILERS-INDUSTRIAL-RESIDUAL OIL-GRADE 6 OIL	13502	E	63
10200401	" "	13503	E	64
10200401	" "	13504	D	65
10200500	EXTERNAL COMBUSTION BOILERS INDUSTRIAL-DISTILLATE OIL	12301	E	61
10200903	EXTERNAL COMBUSTION BOILERS-INDUSTRIAL-WOOD/BARK WASTE-WOOD FIRED BOILER(>50,000 LB STEAM)	12705	E	62

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TABLE C-1. SOURCE CLASSIFICATION CODE ASSIGNMENTS (Continued)

SCC	SCC DESCRIPTION	PROFILE NUMBER	DATA QUALITY	DOCUMENT PAGE NUMBER
10201201	EXTERNAL COMBUSTION BOILERS-INDUSTRIAL-SOLID WASTE-SPECIFY WASTE MATERIAL	15101	E	68
10201301	EXTERNAL COMBUSTION BOILERS-INDUSTRIAL-LIQUID WASTE-SPECIFY WASTE MATERIAL	14102	E	67
10201302	EXTERNAL COMBUSTION BOILERS-INDUSTRIAL-LIQUID WASTE-WASTE OIL	14101	E	66
30102712	CHEMICAL MANUFACTURING-AMMONIUM NITRATE PROD.-PRILLING TOWER(HI DENS)	25409	E	72
30102803	CHEMICAL MANUFACTURING-NORMAL SUPER PHOSPHATE ROCK UNLOADING	25408	D	71
30102804	CHEMICAL MANUFACTURING-NORMAL SUPER PHOSPHATE ROCK FEEDER SYSTEM	25408	D	71
30102823	CHEMICAL MANUFACTURING-NORMAL SUPER PHOSPHATE AMMONIATOR/GRANULATOR	25412	D	76
30102823	" "	25413	D	78
30102824	CHEMICAL MANUFACTURING-NORMAL SUPER PHOSPHATE DRYER	25412	D	76
30102825	CHEMICAL MANUFACTURING-NORMAL SUPER PHOSPHATE COOLER	25412	D	76
30102923	CHEMICAL MANUFACTURING-TRIPLE SUPER PHOSPHATE -AMMONIATOR/GRANULATOR	25408	D	71
30102924	CHEMICAL MANUFACTURING-TRIPLE SUPER PHOSPHATE -DRYER	25408	D	71
30103001	CHEMICAL MANUFACTURING-AMMONIUM PHOSPHATES-DRYERS & COOLERS	25411	D	74

TABLE C-1. SOURCE CLASSIFICATION CODE ASSIGNMENTS (Continued)

SCC	SCC DESCRIPTION	PROFILE NUMBER	DATA QUALITY	DOCUMENT PAGE NUMBER
30103002	CHEMICAL MANUFACTURING-AMMONIUM PHOSPHATES-AMMONIATOR/GRANULATOR	25411	D	74
30103003	CHEMICAL MANUFACTURING-AMMONIUM PHOSPHATES-SCREENING/TRANSFER	25411	D	74
30103004	CHEMICAL MANUFACTURING-AMMONIUM PHOSPHATES-BAGGING/HANDLING	25411	D	74
30104501	CHEMICAL MANUFUACTURING-ORGANIC FERTILIZER-GENERAL:MIXING/HANDLING	25415	E	82
30104501	" "	25414	D	80
30113004	CHEMICAL MANUFACTURING-AMMONIUM SULFATE-ROTARY DRYER	25410	E	73
30113005	CHEMICAL MANUFACTURING-AMMONIUM SULFATE-FLUID BED DRYER	25410	E	73
30300502	PRIMARY METAL PRODUCTION-PRIMARY COPPER SMELTERS-MULTIPLE HEARTH ROASTER	29209	D	95
30300509	PRIMARY METAL PRODUCTION-PRIMARY COPPER SMELTERS-FLUIDIZED BED ROASTER	29209	D	95
30300512	PRIMARY METAL PRODUCTION-PRIMARY COPPER SMELTERS-FLASH SMELTING	29207	D	93
30300514	PRIMARY METAL PRODUCTION-PRIMARY COPPER SMELTERS-REVERBERATORY FURNACE: FUGITIVE EMISSIONS	29203	D	89
30300514	" "	29204	D	90
30300514	" "	29210	D	96
30300515	PRIMARY METAL PRODUCTION-PRIMARY COPPER SMELTERS-CONVERTER:FUGITIVE EMISSIONS	29205	D	91
30300515	" "	29206	D	92
30300515	" "	29211	D	97

TABLE C-1. SOURCE CLASSIFICATION CODE ASSIGNMENTS (Continued)

SCC	SCC DESCRIPTION	PROFILE NUMBER	DATA QUALITY	DOCUMENT PAGE NUMBER
30300524	PRIMARY METAL PRODUCTION-PRIMARY COPPER SMELTERS-MULTI-HEARTH ROASTER/REVERBERATORY FURNACE,OR FLUID BED ROASTER/ELECTRIC FURNACE&CONVERTOR	29208	D	94
30300813	PRIMARY METAL PRODUCTION-SINTERING-WINDBOX	28304	D	85
30300913	PRIMARY METAL PRODUCTION-STEEL PRODUCTION-BASIC OXYGEN FURNACE: OPEN HOOD-STACK	28307	D	87
30300999	PRIMARY METAL PRODUCTION-STEEL PRODUCTION-OTHER NOT CLASSIFIED	28306	D	86
30301009	PRIMARY METAL PRODUCTION-LEAD SMELTERS-LEAD DROSSING	29310	D	98
30301021	PRIMARY METAL PRODUCTION-LEAD SMELTERS-BLAST FURNACE SLAG POURING	29311	E	99
30400107	SECONDARY METAL PRODUCTION-SECONDARY ALUMINUM-HOT DROSSING PROCESSING	20103	D	103
30400214	SECONDARY METAL PRODUCTION--REVERBERATORY FURNACE-CHARGE WITH COPPER	29502	E	111
30400215	SECONDARY METAL PRODUCTION--REVERBERATORY FURNACE-CHARGE WITH BRASS & BRONZE	29501	E	110
30400299	SECONDARY METAL PRODUCTION--FUGITIVE EMISSIONS-OTHER NOT CLASSIFIED	20503	E	109
30400401	SECONDARY METAL PRODUCTION--SECONDARY LEAD SMELTING-POT FURNACE	20405	E	107
30400402	SECONDARY METAL PRODUCTION--SECONDARY LEAD SMELTING-REVERBERATORY FURNACE	20403	E	105
30400413	SECONDARY METAL PRODUCTION--SECONDARY LEAD SMELTING-	20404	E	106

TABLE C-1. SOURCE CLASSIFICATION CODE ASSIGNMENTS (Continued)

SCC	SCC DESCRIPTION	PROFILE NUMBER	DATA QUALITY	DOCUMENT PAGE NUMBER
	SMELTING FURNACE:FUGITIVE			
30400499	SECONDARY METAL PRODUCTION--SECONDARY LEAD SMELTING-OTHERWISE NOT CLASSIFIED	20402	E	104
30400499	" "	20406	E	108
30500609	MINERAL PRODUCTS-CEMENT MANUFACTURING, DRY PROCESS-PRIMARY CRUSHING	27205	D	116
30500610	MINERAL PRODUCTS-CEMENT MANUFACTURING, DRY PROCESS-SECONDARY CRUSHING	27205	D	116
30500618	MINERAL PRODUCTS-CEMENT MANUFACTURING, DRY PROCESS-CEMENT SILOS	27204	E	115
30500619	MINERAL PRODUCTS-CEMENT MANUFACTURING, DRY PROCESS-CEMENT LOAD OUT	27204	E	115
30501504	MINERAL PRODUCTS-GYPSUM MANUFACTURE-CONVEYING	27502	E	117
30501508	MINERAL PRODUCTS-GYPSUM MANUFACTURE-STOCKPILE GYPSUM ORE	27502	E	117
30501520	MINERAL PRODUCTS-GYPSUM MANUFACTURE-DRYING KILN	27503	E	118
30501607	MINERAL PRODUCTS-LIME MANUFACTURE-RAW MATERIAL TRANSFER & CONVEYING	27601	E	119
30501608	MINERAL PRODUCTS-LIME MANUFACTURE-RAW MATERIAL UNLOADING	27601	E	119
30501615	MINERAL PRODUCTS-LIME MANUFACTURE-PRODUCE TRANSFER AND CONVEYING	27601	E	119
30502001	MINERAL PRODUCTS-STONE QUARRYING/PROCESSING-PRIMARY CRUSHING	44103	D	257

TABLE C-1. SOURCE CLASSIFICATION CODE ASSIGNMENTS (Continued)

SCC	SCC DESCRIPTION	PROFILE NUMBER	DATA QUALITY	DOCUMENT PAGE NUMBER
30601201	PETROLEUM INDUSTRY-FLUID COKING UNITS	26208	D	131
30600201	PETROLEUM INDUSTRY-FLUID CATALYTIC CRACKING UNITS (FCC)-FLUID CATALYTIC CRACKING UNIT	26203	C	123
30600201	" "	26204	C	125
30600201	" "	26205	D	126
30600201	" "	26209	D	133
30601401	PETROLEUM INDUSTRY-PETROLEUM COKE CALCINING-COKE CALCINER	26206	D	128
30601401	PETROLEUM INDUSTRY-PETROLEUM COKE CALCINING-COKE CALCINER	26207	D	129
30700106	PULP&PAPER INDUSTRY-SULFATE (KRAFT) PULPING-LIME KILN	27602	D	120
30900202	FABRICATED METAL PRODUCTS-ABRASIVE BLASTING OF METAL PARTS-SAND ABRASIVE	25702	E	144
30988801	FABRICATED METAL PRODUCTS-FABRICATED METALS, FUGITIVE EMISSIONS-SPECIFY IN COMMENTS	25701	E	143
30988802	FABRICATED METAL PRODUCTS-FABRICATED METALS, FUGITIVE EMISSIONS-SPECIFY IN COMMENTS	25703	E	145
31000101	OIL & GAS PRODUCTION-CRUDE OIL PRODUCTION-COMPLETE WELL: FUGITIVE EMISSIONS	1205	C	273
31000101	" "	1206	C	274
31000101	" "	1207	C	275
31000101	" "	1212	C	280
31401101	TRANSPORTATION EQUIPMENT-AUTO BODY SHREDDING-PRIMARY METAL RECOVERY LINE	17109	E	140
31401102	TRANSPORTATION EQUIPMENT-AUTO BODY SHREDDING-MULTIPLE CHAMBER INCINER.	17109	E	140
40400302	BULK PLANTS-PETROLEUM STORAGE TANKS-OIL FIELD STORAGE OF	1208	C	276

TABLE C-1. SOURCE CLASSIFICATION CODE ASSIGNMENTS (Continued)

SCC	SCC DESCRIPTION	PROFILE NUMBER	DATA QUALITY	DOCUMENT PAGE NUMBER
	CRUDE OIL-FIXED ROOF TANK: WORKING LOSS			
40400302	" "	1209	C	277
40400303	BULK PLANTS-PETROLEUM STORAGE TANKS-OIL FIELD STORAGE OF CRUDE OIL-EXTERNAL FLOATING ROOF TANK W/PRIMARY SEALS: STANDING LOSS	1210	C	278
40400303	" "	1211	C	279
40400304	BULK PLANTS-PETROLEUM STORAGE TANKS-OIL FIELD STORAGE OF CRUDE OIL-EXTERNAL FLOATING ROOF TANK W/SECONDARY SEALS: STANDING LOSS	1210	C	278
40400304	" "	1211	C	279
40400305	BULK PLANTS-PETROLEUM STORAGE TANKS-OIL FIELD STORAGE OF CRUDE OIL-INTERNAL FLOATING ROOF TANK:STANDING LOSS	1209	C	277
40400305	" "	1210	C	278
40400305	" "	1211	C	279
50100101	SOLID WASTE DISPOSAL,GOVT.-MUNICIPAL INCINERATION-MULTIPLE CHAMBER	17107	E	137
50100101	" "	17108	E	138
50300201	SOLID WASTE DISPOSAL,INDUSTRIAL-OPEN BURNING-WOOD/VEGETATION LEAVES	42305	E	197
50300201	" "	42306	E	198
50300201	" "	42307	E	199
50300201	" "	42308	E	200
50300201	" "	42309	E	201
50300201	" "	42310	E	202
50300201	" "	42311	E	203
50300201	" "	42312	E	204
50300201	" "	42313	E	205
50300201	" "	42314	E	206
50300201	" "	42315	E	207
50300201	" "	42316	E	208

TABLE C-2. AREA SOURCE CODE ASSIGNMENTS

ASC	ACS DESCRIPTION	PROFILE NUMBER	DATA QUALITY	DOCUMENT PAGE NUMBER
6	RESIDENTIAL FUEL-WOOD	42317	C	209
6	" "	42318	C	210
6	" "	42319	C	211
27	LIGHT DUTY GASOLINE VEHICLES-LIMITED ACCESS ROADS	31202	C	220
28	LIGHT DUTY GASOLINE VEHICLES-RURAL ROADS	31202	C	220
29	LIGHT DUTY GASOLINE VEHICLES-SUBURBAN ROADS	31202	C	220
30	LIGHT DUTY GASOLINE VEHICLES-URBAN ROADS	31202	C	220
35	HEAVY DUTY GASOLINE VEHICLES-LIMITED ACCESS ROADS	31103	C	215
35	" "	31104	C	217
35	" "	31105	C	219
36	HEAVY DUTY GASOLINE VEHICLES-RURAL ROADS	31103	C	215
36	" "	31104	C	217
36	" "	31105	C	219
37	HEAVY DUTY GASOLINE VEHICLES-SUBURBAN ROADS	31103	C	215
37	" "	31104	C	217
37	" "	31105	C	219
38	HEAVY DUTY GASOLINE VEHICLES-URBAN ROADS	31103	C	215
38	" "	31104	C	217
38	" "	31105	C	219
40	HEAVY DUTY DIESEL VEHICLES-LIMITED ACCESS ROADS	32203	C	229
40	" "	32204	C	231
40	" "	32205	E	232
40	" "	32206	C	233
41	HEAVY DUTY DIESEL VEHICLES-RURAL ROADS	32203	C	229
41	" "	32204	C	231

TABLE C-2. AREA SOURCE CODE ASSIGNMENTS (Continued)

ASC	ACS DESCRIPTION	PROFILE NUMBER	DATA QUALITY	DOCUMENT PAGE NUMBER
41	" "	32205	E	232
41	" "	32206	C	233
42	HEAVY DUTY DIESEL VEHICLES-SUBURBAN ROADS	32203	C	229
42	" "	32204	C	231
42	" "	32205	E	232
42	" "	32206	C	233
43	HEAVY DUTY DIESEL VEHICLES-URBAN ROADS	32203	C	229
43	" "	32204	C	231
43	" "	32205	E	232
43	" "	32206	C	233
55	UNPAVED ROAD TRAVEL	41205	C	149
55	" "	44102	C	256
55	" "	44101	C	255
57	CONSTRUCTION	44104	C	258
58	MISCELLANEOUS WIND EROSION	41321	C	183
58	" "	41322	C	184
58	" "	41323	C	185
58	" "	41324	C	186
58	" "	41351	C	187
62	AGRICULTURAL FIELD BURNING	42305	E	197
62	" "	42306	E	198
62	" "	42307	E	199
62	" "	42308	E	200
62	" "	42309	E	201
62	" "	42310	E	202
62	" "	42311	E	203
62	" "	42312	E	204
62	" "	42313	E	205
62	" "	42314	E	206
62	" "	42315	E	207
62	" "	42316	E	208
110	TRANSPORTATION COMPOSITE	33004	C	234
110	" "	33005	C	236
110	" "	33006	C	238
110	" "	33007	C	240
110	" "	33008	C	242
110	" "	33009	C	244
110	" "	33010	C	246

TABLE C-2. AREA SOURCE CODE ASSIGNMENTS (Continued)

ASC	ACS DESCRIPTION	PROFILE NUMBER	DATA QUALITY	DOCUMENT PAGE NUMBER
110	" "	33011	C	247
111	LIGHT DUTY DIESEL VEHICLES	32102	C	224
111	" "	32103	C	226
111	" "	32104	C	228
112	TIRE WEAR	34003	E	249
112	"	34004	E	250
112	"	34005	E	251
112	"	34006	E	252
113	PAVED ROADS	41111	C	153
113	"	41112	C	155
113	"	41113	C	156
113	"	41114	C	157
113	"	41115	C	159
113	"	41116	C	160
113	"	41117	C	161
113	"	41118	C	162
113	"	41119	C	164
113	"	41120	C	166
113	"	41121	C	167
113	"	41122	C	168
113	"	41123	C	169
113	"	41124	C	171
113	"	41131	C	173
113	"	41132	C	174
113	"	41133	C	175
113	"	41134	C	176
113	"	41135	C	177
113	"	41136	C	178
113	"	41137	C	179
115	VOLCANIC ASH	43304	E	188
115	"	43305	E	189
115	"	43306	E	190
115	"	43307	E	191
115	"	43308	E	192
115	"	43309	E	193

APPENDIX D

PM PROFILE COMPOSITING PROCEDURE

Composite profiles were prepared for several of the new PM species profiles appearing in this document. In addition to the 147 new profiles identified in this addendum, 11 composites were developed for source classification codes (SCC's) that had multiple profile assignments. Composites were only prepared after a careful examination of the individual profiles assigned to the same SCC to ensure that the same source type existed and that the data could logically and technically be composited. Composites were not prepared for road dust profiles because of the unique site-specific applicability of these profiles.

In the broadest sense, the composites represent average values for each specie emitted by the source type/SCC in question. The objective in providing composites is to simplify the use of profiles for all user groups whether they are compiling emission estimates or conducting source-receptor modeling. Composites are generated strictly from calculational procedures and therefore may be computed in a variety of ways. The methods used to produce the 11 composite profiles in this addendum to the Species Manual are summarized in this appendix.

The first step in the compositing process was to identify SCC's that had multiple profile assignments. Once this was done, the individual profiles within a given SCC were evaluated for consistency (i.e., were they actually all describing the same source type). Often an SCC may be general enough that several related but slightly differing operations are categorized together. To ensure suitability for compositing, the emission source type must be the same among profiles and other factors governing emissions such as fuels or materials processed and control equipment must be the same. Where these factors were all consistent, compositing was possible.

Once the individual profiles to be composited had been determined, the species present in each profile were evaluated to determine which could be composited. For the purposes of this addendum to the PM Species Manual, composites were only prepared for species that were analyzed in each individual profile assigned to the same SCC (i.e., same source type, control device, etc.). For example, if there were five profiles to be composited and two of the five did not analyze for silver in any size range, then silver was not made a part of the composite. A specie was included as long as each profile was analyzed for it in at least one particle size range.

The only exception to this general rule was Profile 11215, which included several species that did not occur in every input profile. The seven input profiles for the composite contained only five species that were shared by all profiles. Since the number was so few, an optional approach was used to increase the number of species in the composite. For the purposes of the composite Profile 11215, a specie was composited if it occurred in at least four of the seven input profiles. This increased the number of species in the composite to 19.

Once the target list of species to be composited was established, the compositing procedure became a simple calculational exercise. Similar specie values within each particle size range were arithmetically averaged to produce the composite values. In cases where a specie was analyzed for in most but not all particle size ranges, the missing range was excluded from the averaging procedure. For example, if there were three profiles with arsenic values but in one profile the 2.5-10 um size range was not evaluated, the composite profile for arsenic at 2.5-10 um would be based on an average of two values instead of three.

Data quality assignments for the composites were based on the quality ratings of the individual contributing profiles. If all of the individual profiles for a composite were of like quality, e.g., C, then the composite was also rated at C. If the individual profiles had varying quality ratings, then a subjective decision was made regarding the overall trend of the data ratings. If the majority of individual profiles in a composited group had a lower rating (e.g., three were D's and two were C's), then generally the lower rating was assigned to the composite. Because of the nature of the composting process, data quality rating assignments for the composites tended to be conservative so as to not over emphasize the usefulness of the composites.

Uncertainty was not evaluated for the 11 composites prepared for this addendum. The reasons for this decision were that several of the individual profiles did not address uncertainty and the technical validity of averaging the available uncertainty estimates in a composite is questionable.

APPENDIX E

Documentation of the Mobile Source Profile Development Procedures

The purpose of this appendix is to provide a description of the calculation procedures used to develop VOC speciation profiles for the Light-Duty Gasoline Vehicles (LDGV) category. The specific profiles of concern are 1101, 1203, and 1204. The Light-Duty Gasoline Vehicles Profile 1101 was developed using the 46 in-use passenger car study conducted by Sigsby, et al.[1] Exhaust and evaporative (hot soak) emission composition data collected during this study were composited using information from AP-42, Volume II (fourth edition).[2] Data generated by Sigsby, et al did not contain measurements of diurnal emission composition. Therefore, diurnal emission composition data were estimated using data from a study by Black and High and another study by Gabele.[3,4]

The data set from the 46-car study was representative of in-use vehicles from 1975 to 1982. For model years prior to 1975 and after 1982, it was assumed that the data for model years 1975 and 1982, respectively, would be representative.

The following procedure was used in developing Profile 1101:

(a) For each car, estimate average exhaust emission composition from the Federal Test Procedures (FTP), New York City Cycle (NYCC), and Crowded Urban Expressway (CUE) test data:

Exhaust average car = (FTP + NYCC + CUE)/3

(b) For each model year, calculate average exhaust emission composition:

Exhaust average model year = $\sum_{i=1}^{n}$ exhaust average car/n

where n is the number of cars tested for a given model year.

(c) For each model year, calculate average hot soak evaporative composite:

Hot soak average model year = $\sum_{i=1}^{n}$ hot soak car/n

(d) Estimate an average diurnal evaporative composition using the data from References 3 and 4. Assume this represents all model years.

(e) For each model year, estimate average evaporative emission composition:

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Evaporative average model year = (0.265 x hot soak average model year + 0.735 x average diurnal)/2

The weighting factors 0.265 and 0.735 were estimated from Reference 5.

(f) Estimate weighting factors for exhaust and evaporative emissions for model years 1968-1987. Use AP-42 (pp. H-4,6) for LDGV at low altitude (including tampering).

- estimate accumulated mileage
- estimate evaporative emissions
- estimate exhaust emissions
- estimate fraction of evaporative emissions (f_{ev})
- estimate fraction of exhaust emissions (f_{ex})

(g) Estimate weighted average exhaust/evaporative emission composition for each model year:

Exhaust/evaporative average model year =
f_{ex}(exhaust average model year) + f_{ev}(evaporative average model year)

(h) Estimate travel fraction (f_{tr}) for each model year from 1968-1987. Use the procedure in AP-42 (pp. H-11,12).

(i) Weight the profiles from (g) by travel fractions estimated in (h).

$$\text{Profile 1101} = \sum_{1968}^{1987} f_{tr}\ \text{model year} \times (\text{Exhaust/evaporative average model year})$$

In the profile data, 15 percent of n-butane in exhaust emissions was assumed to exist as 1,3-butadiene.[6,7] Also, the split between cyclohexane and benzene in the cyclohexane/benzene peak was assumed as 50/50.[8]

The approach used for developing Profiles 1203 and 1204 to represent exhaust and evaporative emissions, respectively, from light-duty vehicles was similar to that used for Profile 1101. For Profile 1203, steps (c), (d), (e), (f), and (g) outlined for Profile 1101 were not applied. Step (i) was applied after the exhaust average model year term replaced the exhaust/evaporative average model year term. For Profile 1204, steps (a), (b), (f), and (g) were not applied. In the final step (i), the exhaust/evaporative average model year term was replaced by the evaporative average model year and the f_{tr} model year term was applied to only the hot soak average model year position.

FACTORS USED IN DEVELOPING PROFILE 1101

Year	f_{ex}	f_{ev}	f_{tr}
1968	.67	.33	.004
1969	.67	.33	.003
1970	.68	.32	.005
1971	.71	.29	.007
1972	.72	.28	.011
1973	.72	.28	.016
1974	.72	.28	.021
1975	.70	.30	.028
1976	.69	.31	.034
1977	.68	.32	.041
1978	.84	.16	.049
1979	.83	.17	.056
1980	.69	.31	.065
1981	.66	.34	.074
1982	.63	.37	.084
1983	.60	.40	.097
1984	.56	.44	.110
1985	.50	.50	.123
1986	.40	.60	.135
1987	.33	.67	.038

f_{ex} = exhaust average model year emission composition.
f_{ev} = evaporative average model year emission composition.
f_{tr} = travel fraction for each model year.

APPENDIX E REFERENCES

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3. Black, F. and L. High. Passenger Car Hydrocarbon Emissions Speciation. EPA Report No. EPA-600/2-80-085. U. S. Environmental Protection Agency, Research Triangle Park, North Carolina. May 1980.

4. Telecon. Gunseli Shareef, Radian Corporation with P. A. Gabele, U. S. Environmental Protection Agency. July 1987. Diurnal emission composition data.

5. Black, F. HC Emissions from Late Model Gasoline Motor Vehicles. U. S. Environmental Protection Agency, Research Triangle Park, North Carolina. 1987.

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7. Telecon. Gunseli Shareef, Radian Corporation with Penny Carey, U. S. Environmental Protection Agency/Office of Mobile Sources. March 24, 1987. Percentage of 1,3-butadiene in vehicle emissions where it is reported as n-butane/ 1,3-butadiene.

8. Memorandum from Gray, C. L., U. S. Environmental Protection Agency to J. Calcagni, U. S. Environmental Protection Agency and W. Laxton, U. S. Environmental Protection Agency. March 23, 1989. Motor Vehicle VOC Speciation for SIP Development.